Rocky Flats
Environmental Technology Site

BUILDING 776/777 CLOSURE PROJECT
DECOMMISSIONING OPERATIONS PLAN

REVISION 0

FINAL DRAFT

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The following DCFs are active for this procedure:

None	

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EXECUTIVE SUMMARY

The Building 776/777 Cluster is comprised of Buildings 701, 702, 703, 710, 712, 712A, 713, 713A, 730, 776/777, and 781, which are located within the Protected Area (PA) of the Rocky Flats Environmental Technology Site (RFETS). Closure of the Building 776/777 Cluster is necessary to meet the goals of the Rocky Flats Cleanup Agreement (RFCA), (Ref. 1), and the RFETS 2010 Plan (Ref. 2). Three alternatives were considered for the near-term management of the Building 776/777 Cluster:

- Alternative 1 - *Decommissioning*
- Alternative 2 - *No Action with Safe Shutdown Maintenance*
- Alternative 3 - *Reuse of the Facilities*

The alternatives were evaluated for effectiveness, feasibility, and relative costs. Alternative 1 is the selected alternative. Decommissioning clearly supports the Rocky Flats Vision (Ref. 3) of safe, accelerated, and cost-effective closure. This alternative has the lowest life-cycle costs and most rapid risk reduction, and it is integrated with Site operations. This alternative also maintains long-term protection of public health and the environment. Short-term impacts on the environment (i.e., impacts occurring during the interval of the action) can be physically and administratively controlled. There are no significant negative aspects to decommissioning the Building 776/777 Cluster at this time.

Currently, all buildings in the B776/777 Cluster are scheduled to be deactivated and decommissioned by the close of fiscal year (FY)06 and remediated by the close of FY07. These dates are subject to change, based on the accelerated schedules contained in the RFETS 2006 Plan, which is currently under development. Environmental impacts resulting from the Building 776/777 Closure Project will contribute incrementally to potential site-wide cumulative impacts associated with the overall RFETS Closure Project. Given the existing industrial setting of the Building 776/777 Cluster, environmental impact issues associated with the project are relatively limited.

For planning purposes, the Cluster was divided into small manageable groupings of similar equipment and rooms that could be worked independently and within a one-year estimated time frame. A total of 84 groups, or SETs, were defined for the Cluster. Next, the SETs were prioritized to establish the order in which they would be decommissioned, taking into account such factors as physical constraints, personnel and environmental health and safety (H&S), operational/technical issues, management issues, costs, and waste generation issues. The Decontamination and Decommissioning Characterization Protocol (DDCP), (Ref. 4), was then used in conjunction with process knowledge to complete a reconnaissance level characterization (RLC) for each SET. Results were documented in the Reconnaissance Level Characterization Report (RLCR), (Ref. 5), which identified the presence of radiological and beryllium (Be) contamination, as well as hazards such as lead and other heavy metals, polychlorinated biphenyls (PCBs), special nuclear material (SNM) holdup, radioactive sources, and waste chemicals in many of the SETs located in Building 776/777 and Building 730. Following the RLC, endpoints (i.e., completion criteria) were developed for each SET and size reduction and decontamination methodologies were examined to complete the development of the decommissioning sequence.

Buildings with significant contamination or hazards (i.e., Type 3 buildings) and buildings without significant contamination or hazards, but in need of decontamination (i.e., Type 2 buildings), will be

decommissioned in accordance with this Decommissioning Operations Plan (DOP). Buildings within the Cluster that are free of contamination (i.e., Type 1 buildings) will be decommissioned using Site procedures upon notification of the Lead Regulatory Agency (LRA), (i.e., the Colorado Department of Public Health and Environment [CDPHE]). As detailed in the RLCR, Building 776/777 is believed to be a Type 3 building, Building 730 is believed to be a Type 2 building, and the remaining buildings in the Cluster are believed to be Type 1 buildings. Therefore, the scope of this DOP is limited to Buildings 776/777 and 730. It is recognized that additional sampling and analysis will be required to verify the characterization of the Type 1 buildings. In the event sampling results indicate the presence of contamination and/or hazards in one or more of the Type 1 buildings, the building(s) will be re-typed and added to a subsequent decision document(s), which may include a modification to this DOP.

The RFCA definition of decommissioning includes the demolition of building structures. At this time, demolition methods and techniques are still being identified for the Building 776/777 Cluster, along with associated controls and performance specifications necessary to protect worker safety, public health, and the environment. As a result, the demolition stage of decommissioning is not included in Revision 0 of the DOP. This information will be provided in a subsequent decision document(s), which may include a modification to this DOP.

Work performed under this DOP will be accomplished in conformance with the RFETS Integrated Work Control Program (IWCP), Integrated Safety Management System (ISMS), and applicable quality assurance (QA), waste management and radiological control requirements. Hazardous and mixed process waste and liquid waste chemicals will be managed in compliance with the substantive and administrative requirements of the Resource Conservation and Recovery Act (RCRA), (Ref. 6), the Colorado Hazardous Waste Act (CHWA) (Ref. 7), and associated implementing regulations. All other waste will be managed as remediation waste in accordance with the Applicable or Relevant and Appropriate Requirements (ARARs) under the Comprehensive Response, Compensation, and Liability Act (CERCLA), (Ref. 8).

Decommissioning activities will be documented in the Building 776/777 Closure Project Record, the RCRA Operating Record, and the CERCLA Administrative Record. Upon completion of decommissioning activities and final characterization, a Final Closeout Report will be prepared for review and approval by the LRA.

1.0 INTRODUCTION

Closure of the Building 776/777 Cluster is necessary to meet the goals of RFCA (Ref. 1) and the RFETS 2010 Plan (Ref. 2). The Building 776/777 Closure Project is managed under the RFETS Closure Project Baseline (CPB), which describes the life-cycle schedule for the scope of work contained in the 2010 Plan.

The overall project strategy is to prioritize closure activities, taking into account personnel, public, and environmental H&S; physical constraints; operational and technical issues; management issues; cost; and waste generation issues. As shown in Figure 1, closure activities for the Building 776/777 Cluster are divided into three phases: deactivation, decommissioning (including demolition), and environmental restoration.

Currently, all buildings in the B776/777 Cluster are scheduled to be deactivated and decommissioned by the close of FY06 and remediated by the close of FY07. These dates are subject to change, based on the accelerated schedules contained in the RFETS 2006 Plan, which is currently under development.

Deactivation activities are being completed in conformance with the Building 776/777 Closure Project Execution Plan (PEP). Buildings with significant contamination or hazards and buildings without significant contamination or hazards, but in need of decontamination, will be decommissioned in accordance with this DOP. Buildings within the Cluster that are free of contamination will be decommissioned using Site procedures following notification to the LRA.

The RFCA (Ref. 1) definition of decommissioning includes the demolition of building structures. At this time, demolition methods and techniques are still being identified for the Building 776/777 Cluster, along with associated controls and performance specifications necessary to protect worker safety, public health, and the environment. As a result, the demolition stage of decommissioning is not included in Revision 0 of the DOP. This information will be provided in a subsequent decision document(s), which may include a modification to this DOP.

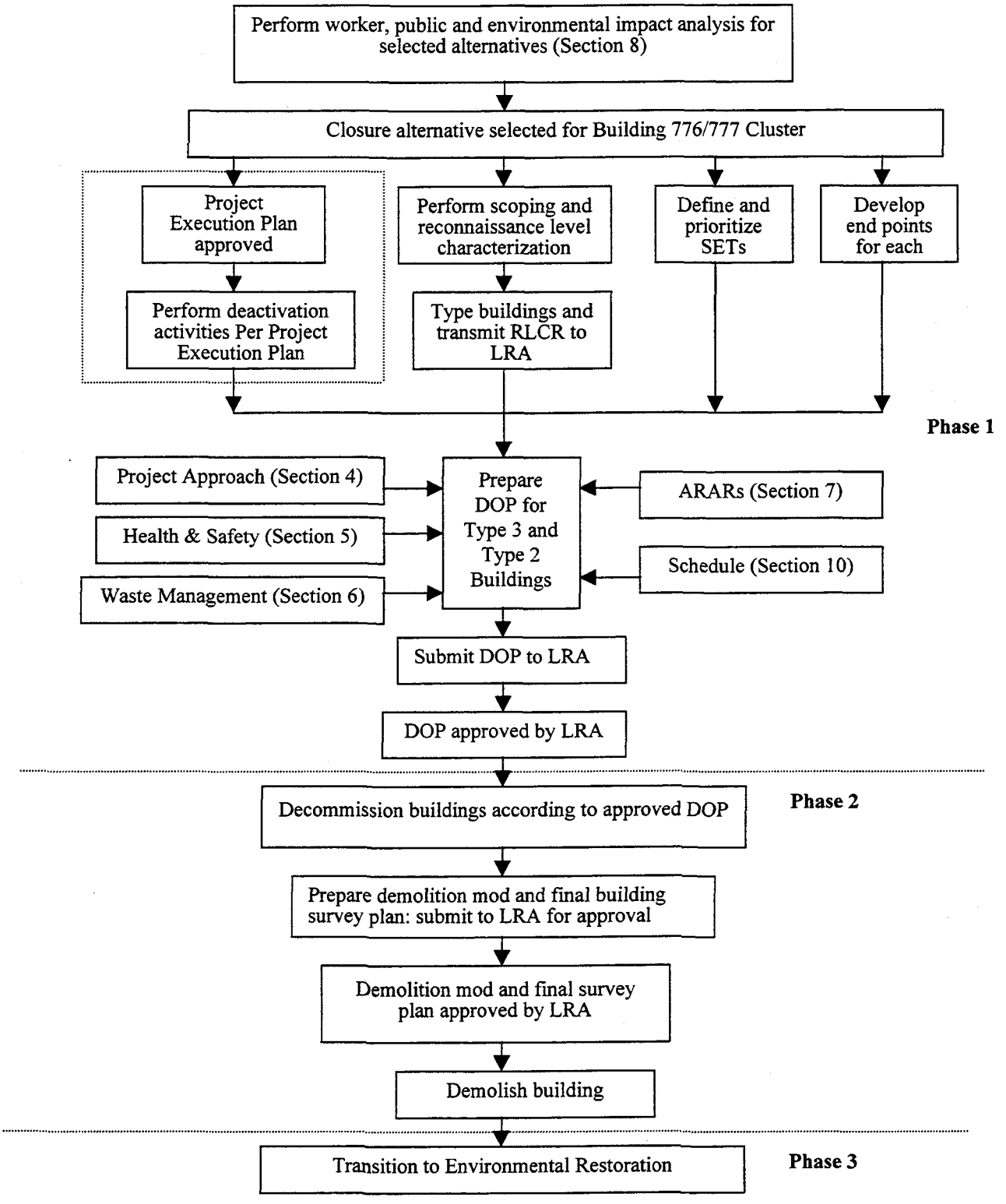

Figure 1. Closure Planning Phases for Type 2 and Type 3 Buildings in the Building 776/777 Cluster

2.0 BUILDING CLUSTER DESCRIPTION

Building 776/777 is a two-story structure with a partial basement and common wall separating Buildings 776 and 777. A tunnel located at the northwest corner of Building 776 connects to Building 771, an above-ground crossover on the east side of Building 777 connects to Building 779, and a hallway on the south side of Building 776 connects to Building 707.

The first floor of Building 776/777 has an area of 135,000 ft^2; the second floor, 88,000 ft^2; and the basement, 1,600 ft^2, for a building total of 224,600 ft^2. Since the building was first constructed, several additions have been made to the original structure (see Figure 2), including the east side of Building 777 (columns [cols.] 21-25, D-L); parts storage (cols. 19-23, L-P); assembly development (cols. 23-35, H-L); dock enclosures (Room 437); radiography, cleaning and plating facility (cols. 23-25, L-P); high pressure gas test facility (southeast corner of Building 777); two-story office addition (southeast side of Building 777); fabrication (cols. 1-3W, A-P); autoclave facility; and the Betatron vault. In addition, a second roof was added to cover the majority of the original roof after a major fire in 1969.

Buildings 776 and 777 share most utilities, including supply and control of potable water, eyewash and emergency body showers, cooling water, sanitary sewage, building heating and air conditioning, glovebox (GB) and vacuum air supply, emergency electrical power, and compressed air.

Buildings 776 and 777 also share some utilities with surrounding buildings. Measures for re-routing connections or providing temporary services will be included in the planning and engineering for Building 776/777 decommissioning activities. Following is a list of the shared utilities:

- Breathing air is provided from Building 707;
- Steam from Building 776/777 heats the water for the Building 778 locker rooms;
- Plant air is shared between Buildings 776/777, 779 and 771;
- Emergency power for the Building 776/777 criticality alarm panel (located in Building 750) is supplied from Building 708, which is also the Building 707 emergency generator;
- The classified telecommunications center for the Site is located in Building 777;
- The chainveyor between Building 707 and Buildings 776/777 is a common line provided with inert gas from both Building 707 and Buildings 776/777; and
- Building 776/777 provides electrical service and ventilation for the Building 771 tunnel and Building 779 crossover.

Support systems are located in the following buildings, which are also included in the Building 776/777 Cluster:

- Building 701 (research and development laboratory, 5,170 ft^2),
- Building 702 (pump house for B712, 924 ft2),
- Building 703 (pump house for B713, 1,080 ft^2),
- Building 710 (steam reducing station, 352 ft^2),
- Building 712 (cooling tower, 2,425 ft^2),

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Personnel with access to UCNI may obtain this information from
the Building 776/777 Cluster Closure Project Manager.

Figure 2. Building 776/777 Additions

- Building 712A (propane valve house, 90 ft^2),
- Building 713 (cooling tower, 2,475 ft^2)
- Building 713A (valve pit, 250 ft^2),
- Building 730 (plenum deluge tank pit, 698 ft^2), and
- Building 781 (helium compressor pit, 440 ft^2).

Figure 3 shows the location of the buildings that comprise the Building 776/777 Cluster.

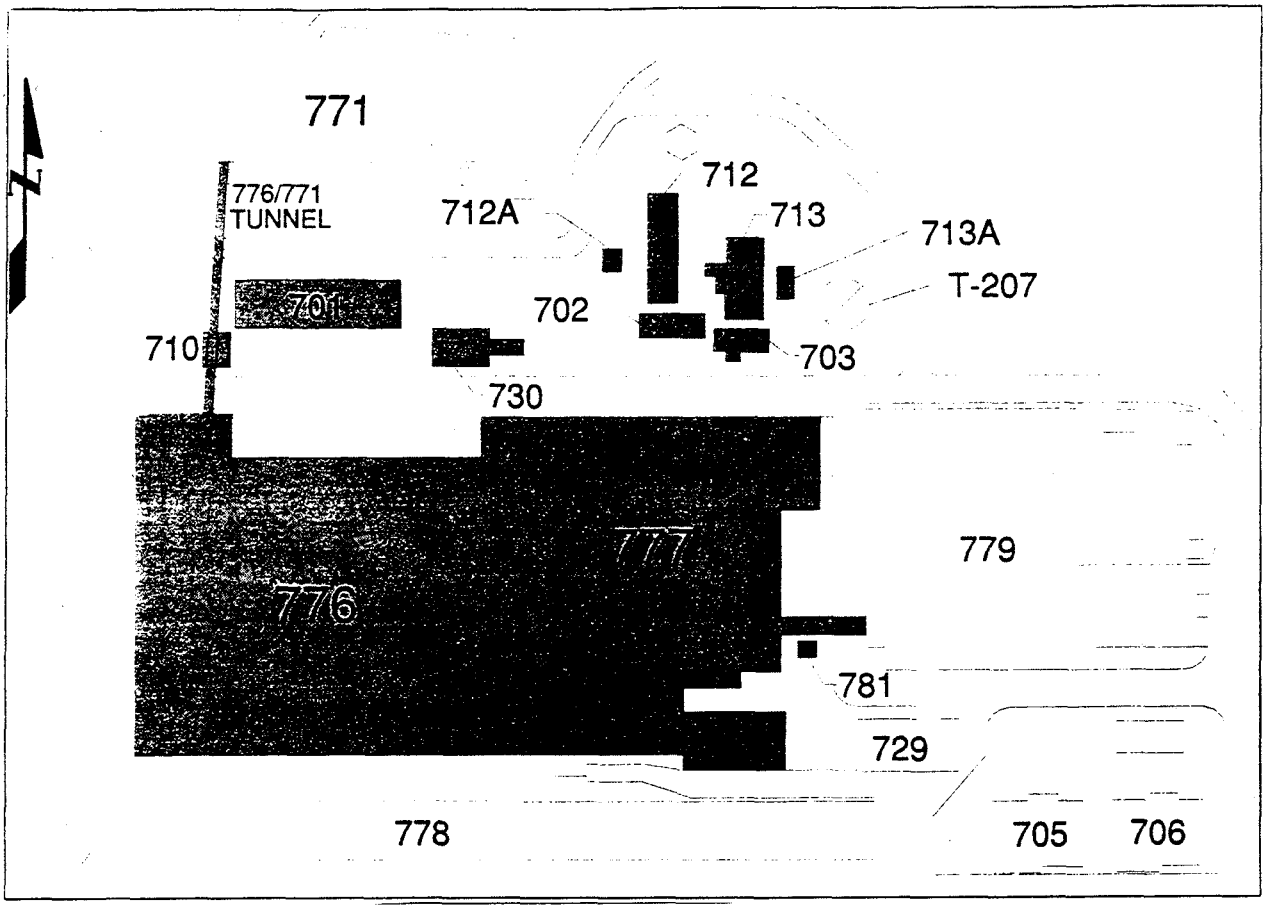

Figure 3. Building 776/777 Cluster Facilities

2.1 Building History

The Building 776/777 Cluster was constructed between 1955 and 1957. Beginning in 1958 and continuing through 1969, Building 776 was the main manufacturing facility for plutonium (Pu) weapons components and it housed a Pu foundry and fabrication operations. The main function of Building 777 was parts assembly. Following a major fire in Building 776/777 in 1969, the majority of the foundry and fabrication operations were transferred to Building 707. Although limited production operations were resumed in Building 776/777 when cleanup activities were completed, at that point, the main focus of the building was shifted to waste and residue handling, disassembly of retired weapons components, and special projects. Processes conducted in Building 776 included size

reduction, advanced size reduction, pyrochemistry, coatings operations, and test runs of organic waste and combustibles in a fluidized bed incinerator (FBI). Building 777 operations included machining, product assembly and disassembly, testing and inspection of special weapons projects, and support operations, such as laboratories. Table 1 presents an historical summary of Building 776/777 Cluster operations.

Building 776/777 contained an extensive GB network that supported various Pu production operations. Prior to the 1969 fire, the majority of the building space consisted of one large room. Subsequent to the fire, most GBs were removed from Building 776 and the large room was compartmentalized into several areas separated by physical barriers to confine radioactive material releases. A negative pressure ventilation system is used to prevent areas of least contamination from becoming contaminated by areas of higher contamination. The building is equipped with a series of high efficiency particulate air (HEPA) filters to control air emissions to the environment.

Table 1. Historical Timeline

Year	Event
1957	Construction of Building 776/777 Cluster was completed.
1958	The first significant machining of Pu began.
1964	Pu and carbon tetrachloride exploded during a briquetting operation in Building 776.
1965	The "GB drain line fire" occurred during maintenance on a plugged oil coolant drain line in Building 776/777. The fire was attributed to spontaneous combustion of Pu chips. The fire spread contamination inside the building. Affected areas were decontaminated and painted to fix contamination that was not removed.
1969	Waste operations began in Building 776, originally initiated for disposing of contaminated material from the 1969 fire.
1971	Clean-up activities for the 1969 fire were completed on October 18th.
1972	Pu fabrication operations in Building 776 were transferred to Building 707. Building 776 was converted to a waste storage and size reduction facility.
1989	Pu production operations ceased in November.

2.2 Building 776/777 Fire

On May 11, 1969, a major fire in Building 776/777 resulted in gross radiological contamination of Building 776/777 and portions of Buildings 771 and 779. The fire occurred in Room 134 in the north foundry line and propagated by way of the chainveyor system. The first floor operating areas of Buildings 776 and 777 were highly contaminated. The entire second floor of Building 776 was moderately contaminated from air-borne contamination through the floors and walls. The office areas in Building 776 were moderately contaminated from water-borne material, mainly on the floors. The roof of Building 776 was moderately contaminated in three areas. Two contaminated areas were

localized around sanitary vent penetrations; the third, more extensive area extended from the exhaust duct to the edge of the roof. [1] The fire resulted in the relocation of some of the foundry, fabrication, and assembly operations to Building 707. During cleanup, some pieces of contaminated equipment, including presses, a rolling mill, casting furnaces and associated GBs were size reduced and buried under the floors in Building 776 (see Section 4.3.2.1 for further details).

After the fire, the major production operations in the building were reduced to machining operations on the south line in Building 776 and disassembly of retired weapons components and assembly operations in Building 777. In Building 776, the empty spaces resulting from the fire were converted to perform waste-related operations, focusing on waste reduction. Other operations conducted in the Cluster included Pu recovery operations in Building 776 and support operations, such as storage and laboratory work, in both buildings. These operations continued until production was curtailed at Rocky Flats in 1989.

2.3 Current Status

Routine operations are conducted in Building 776/777 16 hours per day, five days per week. However, stationary operating engineers, radiological control technicians, and security personnel staff the building 24 hours a day, seven days a week. The Shift Manager, Configuration Control Authority (CCA), or designee, provides initial emergency response and mitigation actions during off-shift hours and normal administrative functions on the weekends, holidays, and off-normal shifts. With the exception of Buildings 776/777 and 701, buildings and structures within the Cluster are not normally occupied and are usually under lock and key.

The majority of building personnel are involved in maintaining vital safety systems (VSS), performing Limiting Conditions for Operations (LCO) surveillances and RCRA inspections, repackaging special nuclear material (SNM), and managing waste.

The Building 776/777 Cluster contains RCRA regulated tanks systems, treatment units, and container storage areas, including rooms, vaults, and GBs. A complete listing of RCRA units is provided in Section 4.5. In addition, the Cluster contains the following six individual hazardous substance sites (IHSSs):

- 118.1 - Multiple solvent spills west of Building 730,
- 118.2 - Radiological contamination in soil,
- 132 - Leaking underground laundry waste tanks,
- 144 - Radiological contaminated laundry waste water line break,
- 150.2 - Radiological contamination in soil (resulting from the 1957 and 1969 fires), and
- 150.7 - Radiological contamination in soil (resulting from the 1969 fire).

Building 776/777 currently stores approximately 3,200 waste containers. Of the 3,200 containers, 100 are sanitary waste, 650 are low-level (LLW)/low-level mixed (LLM) waste, 350 are transuranic (TRU)/transuranic mixed (TRM) waste, and the remaining 2,100 are residues (RES/REM). In addition, the building contains 279 contaminated GBs and B-boxes with interconnecting chainveyor

[1] Details regarding roof contamination and removal will be provided in the demolition modification to this DOP, which will be added as a major modification in compliance with ¶127 of RFCA prior to the initiation of demolition activities.

lines, a size reduction vault, advanced size reduction facility (ASRF), FBI pilot unit, FBI production unit, horizontal and vertical accelerator, HEPA low specific activity counter, and a supercompactor.

SNM is being removed from vaults within the building to reduce the amount to below the safeguard termination limits. This activity began in FY98 and is planned for completion in FY99. SNM high holdup areas have been identified. Additional SNM holdup scans are planned and these areas will be remediated, as necessary.

2.4 Building Classification

The Decommissioning Program Plan (DPP), (Ref. 9), defines building types as follows:

- Type 1 buildings are free of contamination,
- Type 2 buildings are without significant contamination or hazards, but in need of decontamination, and
- Type 3 buildings have significant contamination or hazards.

Each building type has its own degree of regulation. The DPP serves as the RFCA (Ref. 1) decision document for Type 1 buildings, thus decommissioning may proceed based on RFETS procedures upon notification of the LRA. Types 2 and 3 buildings require a separate RFCA decision document. Based on the RLC performed in 1997 and 1998 (see Section 4.3.2), Building 776/777 is believed to be a Type 3 building, Building 730 is believed to be a Type 2 building, and the remaining buildings in the Cluster are believed to be Type 1 buildings. As a result, this DOP addresses the decommissioning of Building 776/777 and Building 730, only. However, it is recognized that additional sampling and analysis will be required to verify the characterization of the Type 1 buildings. In the event future survey data indicate that contamination and/or hazards are present in one or more of these buildings, they will be addressed in a subsequent decision document(s), which may include a modification to this DOP.

2.5 Expected Condition of Buildings 776/777 and 730 at Start of Decommissioning

The expected condition of Building 776/777 and Building 730 at the start of decommissioning is discussed in Section 4.11 and 4.12.

3.0 ALTERNATIVES ANALYSIS

Alternatives considered for Buildings 776/777 and 730 support the Rocky Flats Vision (Ref. 3), which requires buildings to be decontaminated for future use or decommissioned, as appropriate. The following three alternatives were examined:

- Alternative 1 - *Decommissioning*
- Alternative 2 - *No Action with Safe Shutdown Maintenance*
- Alternative 3 - *Reuse of the Facilities*

The criteria used to evaluate the alternatives were effectiveness, feasibility, and relative costs. The results of the alternatives analysis are summarized in Table 2.

Alternative 1 - *Decommissioning* is the selected alternative because it is the best alternative to meet the evaluation criteria. The Rocky Flats Vision of safe, accelerated, and cost-effective closure is clearly supported by the decommissioning of the Building 776/777 Cluster. This alternative results in the lowest life-cycle costs and most rapid risk reduction, and it is integrated with Site operations. This alternative also maintains long-term protection of public health and the environment. Physical and administrative measures can be implemented to control short-term impacts to the environment (i.e., impacts occurring during the interval of the action). At this time, there are no significant negative aspects to decommissioning the Cluster.

Alternative 2 - *No Action with Safe Shutdown Maintenance* does not achieve RFETS goals. This alternative does not accomplish accelerated closure, and it defers decommissioning to an unspecified date. This results in an increase in the life-cycle cost of closure. Inaction achieves the short-term protection of public health and the environment; however, this protection decreases over time, due to continued degradation of systems and equipment through aging. Furthermore, under this alternative the waste and debris requiring treatment and/or disposal and the risks associated with managing them are also deferred.

Alternative 3 - *Reuse* is not feasible because it is neither required nor beneficial. As with Alternative 2, implementation of this action will result in deferral, not elimination, of the decommissioning activities necessary for final closure.

Table 2. Alternatives Analysis Summary

Alternative	Description	Effectiveness	Feasibility	Relative Cost
1-Decommissioning	*Decommissioning* activities will follow specific plans approved by DOE and the LRA. Activities consist of decontamination, as deemed necessary; equipment dismantlement; size reduction; and demolition of building structures.	Decommissioning is effective in achieving the long-term goals of RFCA. The mortgage costs are eliminated, and the risks and hazards are significantly reduced.	Technology currently exists to achieve the objectives of this alternative. Integration with other Site activities can be accomplished.	Immediate decommissioning results in the lowest life-cycle costs. Once decommissioning is achieved, minimal landlord costs are incurred.
2 – No Action	*No Action* will maintain the 776/777 Closure Project in its current configuration. No additional equipment would be removed unless the present safe shutdown status of the Cluster is compromised.	*No Action* delays closure activities that must be performed to meet the goals of RFCA. Deferring closure could make funding available to other Site closure activities. However, *No Action* could increase risk to workers and the environment if the integrity of the facility is jeopardized.	*No Action* would disrupt the long-term plans for RFETS.	*No Action* results in higher costs than immediate decommissioning since landlord costs continue to be incurred until decommissioning begins.
3 – Reuse	*Reuse* of the 776/777 Cluster would maintain the facilities in their current configuration. A new mission for the facilities, in support of the present Site cleanup mission, would be assigned by the Site Utilization Review Board. Depending on the nature of this mission, removal of equipment may be necessary. No changes would be made before definition of the new mission.	*Reuse* of the 776/777 Cluster was evaluated by the RFETS Facility Use Committee, which determined there was no further mission for the Cluster. Use of the Cluster for an alternative off-site use was evaluated in accordance with the RFCA Preamble (Objective #7), and DOE Order 4300.1C, subparagraph (g), Disposal of Government-Owned Land Improvements. No further use was identified.	Because no new mission has been identified for the Cluster, implementation of this alternative is not administratively feasible.	This alternative results in the greatest life-cycle costs as the reuse mission would more than likely require expenditures for modifications to the buildings in addition to existing landlord/ surveillance costs. Furthermore, decommissioning costs (adjusted for future value) would still be required.

4.0 PROJECT APPROACH

The overall goal of the Building 776/777 Closure Project is to have all buildings within the Cluster emptied and demolished to slab on grade, with subsurface penetrations capped. The project will then be transitioned to the Environmental Restoration Program for IHSS remediation. The decommissioning planning process for the Building 776/777 Cluster has been completed and the costs and schedules are included in the CPB. During the course of the project, there will be cases where circumstances differ from those predicted. The flexibility to revise planned activities is essential to the successful management of this project.

4.1 SET Descriptions

For planning purposes, the Building 776/777 Cluster has been divided into small, manageable groupings of similar equipment and rooms that can be worked independently. The groupings are referred to as SETs. Eighty-four SETs were developed for the Cluster. The SETs are the foundation for the planning, prioritization, cost estimation, and scheduling of decommissioning activities.

SET descriptions are presented in Appendix A and SET locations are shown in Appendix B. The SETs are categorized by six types: 1) GB, 2) tank, 3) equipment, 4) room, 5) room/equipment, and 6) building structure. Following is a general description of each SET type:

1) GB SETs include GBs, equipment in the GBs, associated external equipment and instrumentation, and piping from the GBs to the nearest cutoff point. In some cases, GB lines are very long and may be broken into as many as four SETs for that particular line.
2) Tank SETs include the tank, associated external equipment and instrumentation, and piping from the tank to the nearest logical cutoff point.
3) Equipment SETs include specific pieces of equipment, associated external equipment and instrumentation, and piping from the equipment to the nearest cutoff point.
4) Room SETs include all equipment and instrumentation not associated with GBs, tanks, or equipment SETs; tools, miscellaneous items, and piping not removed with GBs, or tanks; equipment SETs below eight feet, and interior walls.
5) Room/equipment SETs include all equipment (GBs, tanks, etc.) and instrumentation, tools, miscellaneous items, utilities below eight feet, and interior walls.
6) The building structure SETs include interior and exterior walls, floors, ceilings, and utilities above eight feet.

4.2 SET Prioritization

Once the SETs had been identified, an initial meeting was held to establish the order in which they should be removed. To ensure applicable areas of concern would be identified, representatives from engineering, operations, authorization basis (AB), maintenance, and utilities organizations attended the meeting. An historical subject matter expert (SME), the closure project team members, and representatives from DOE and the CDPHE also attended. The SETs were prioritized using a classical value engineering technique that ranks importance through use of a weighted matrix. The criteria for ranking SETs included physical constraints, safety, operational/technical issues,

management, cost, and waste generation. The initial SET prioritization was then re-evaluated, factoring in the amount of funding available each fiscal year, pathways out of the facility, logistics, resources, and the decommissioning learning curve. The final results of the SET prioritization effort are shown in Figure 4.

4.3 Building 776/777 CLUSTER Characterization

The Building 776/777 Cluster was characterized using a three-step approach:

1) Scoping characterization,
2) Reconnaissance level characterization (RLC), and
3) In-process characterization.

The following paragraphs describe each step in more detail.

4.3.1 Scoping Characterization

During scoping characterization, existing records and documents were collected, then present and former Building 776/777 employees were interviewed to determine the physical, hazardous, radiological, and chemical conditions of the Cluster. Based on the information collected, the B776/777 Closure Project Manager conducted an RLC to document the configuration of equipment, piping, ventilation systems, and types and levels of contamination and hazards within the Cluster.

4.3.2 Reconnaissance Level Characterization

The purpose of the RLC is to establish a preliminary estimate of the types of contamination and hazards that are present. The RLC identifies the location and extent of radiological and Be contamination, and documents the presence of asbestos, lead and heavy metals, PCBs, SNM holdup, waste chemicals, radioactive sources, and physical hazards. The RLC for the Building 776/777 Cluster was performed from November 1997 through June 1998. During that time, process knowledge and detailed walkdowns were used to identify:

- Capital Equipment,
- GBs and hoods,
- Tanks and their respective sizes,
- Other equipment,
- Classified matter,
- Contamination areas and approximate contaminant levels,
- Locations of chemicals,
- Utility and process service connections including water, electrical, steam, and ventilation, and
- Documentation regarding building construction materials.

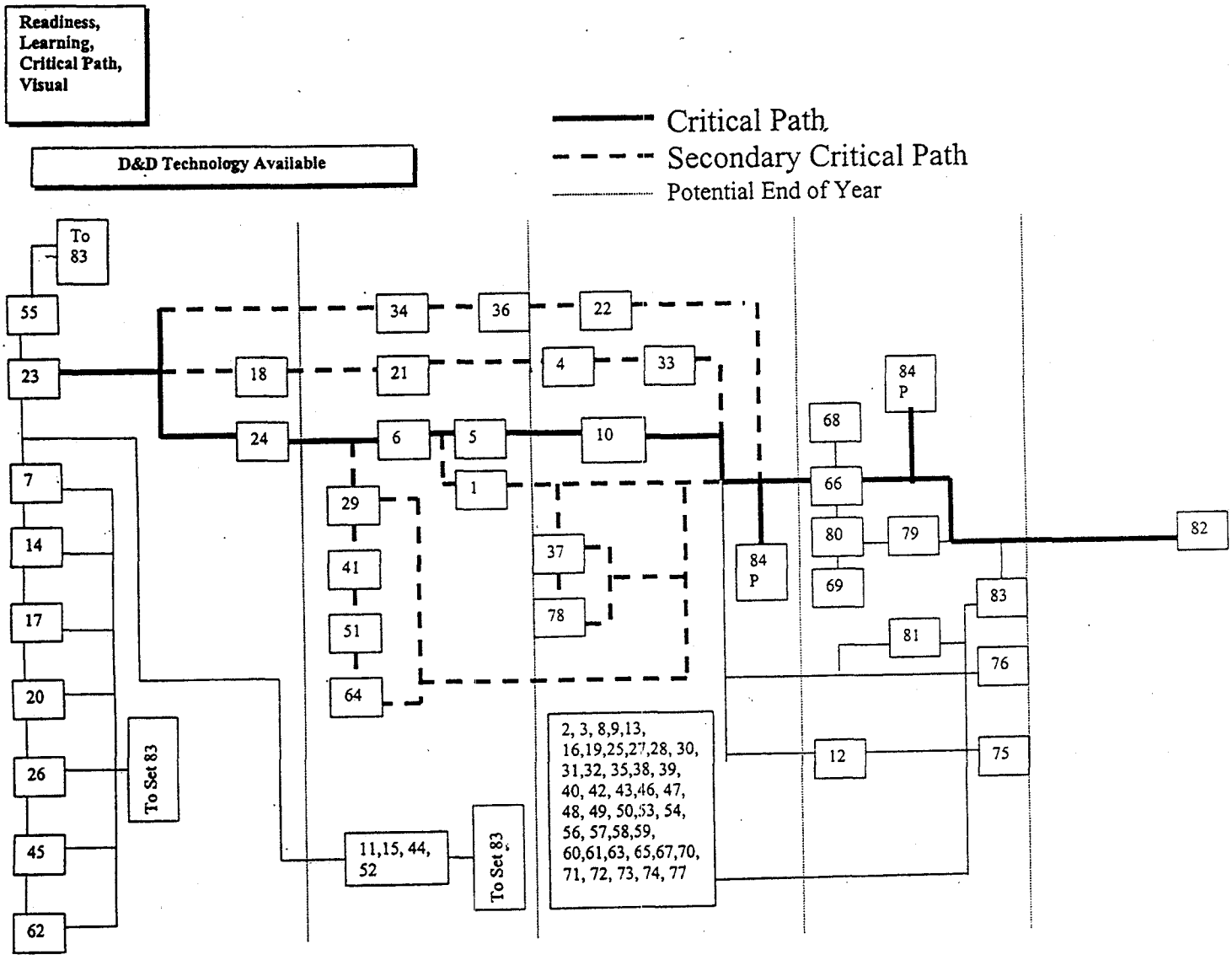

Figure 4 – SET Prioritization

Results from the RLC for the Building 776/777 Cluster are documented in the RLCR, which was transmitted to the LRA in December of 1998. A summary of the contaminants and hazards found in Buildings 776/777 and 730 is presented in Table 3.

4.3.2.1 Equipment Buried Under Building 776/777

In February 1998, ground-penetrating radar was used in designated areas of Building 776/777 to confirm the presence of material cemented in original stairwells, under GBs, and buried under the floors after the 1969 fire. The radar images are on file with the Project Record. These areas are included in SET 84. Planning and engineering for this SET will be completed prior to decommissioning the SET. The planning and engineering effort will provide additional characterization data and detailed information concerning methods for removal of the buried equipment. Under-building contamination will be addressed during environmental restoration. The decommissioning of this SET is not scheduled to begin until FY03.

Testimony from the 1969 fire indicated that some of the original stairwells under GBs were filled with contaminated debris, such as personal protective equipment (PPE), plastic, and other combustibles, then filled with concrete. Because ground-penetrating radar only identifies density changes, these stairwells were not investigated.

Fire testimony documentation also indicated that contaminated debris may have been buried in equipment pits in Building 776. In addition, the original construction drawings for the foundation showed numerous below-grade areas (i.e., equipment pits, underpasses, and sumps) that are no longer visible or accessible. Based on the construction drawings, the original below-grade areas were mapped to determine where equipment might be buried.

Ground-penetrating radar was used in Rooms 118 (SET 63), 134 (SET 67), 127 (SET 68), and the Carpenter Shop (SET 54). These areas are shown in Figure 5. A detailed characterization of these areas may be found in Appendix A of the RLCR. The floor under the FBI in Room 118 (Area C) was confirmed to have a definite change in density that is believed to be the rollers from the rolling mill and the saw used to cut the rollers. The results of the ground penetrating radar in Room 134 adjacent to the manual disassembly area on the ASRF (Area D) were inconclusive. This area will remain as a suspect area of concern for planning purposes during future Site remediation. The area adjacent to the existing basement in Room 127 (Area E) was the largest equipment pit, which appears to be sealed (approximately 1,600 ft^2). Based on the radar images, it appears no equipment or other material is buried in the area. The radar images also indicate that autoclaves are present beneath the Maintenance Carpenter Shop on the west side of Building 776 (Area F). Based on the drawings of this room, it appears the autoclaves are buried approximately 30 feet below grade.

It is believed the paint and solvent pit in Room 125 (SET 1), (Area G), and Room 133 (SET 2), (Area H), were filled to cover contamination. Since the pit in Room 125 is only eight inches deep and the pit in Room 133 is only 12 inches deep, it is believed equipment is not buried in these locations.

Table 3. Extent of Contamination and Hazards Present in Buildings 776/777 and 730

CONTAMINANT	HAZARDS
Radiological Contamination*	B776/777 - *Building Structure*: The building floors, walls, roof, and ceilings are assumed to be contaminated to the levels that existed after the May 1969 Pu fire. *Equipment*: Pu production equipment surface contamination levels are stated in the RLCR. Equipment internal contamination levels are assumed to be $>10^6$ counts per minute (cpm). *Process Piping*: Process piping is contaminated to levels of the May 1969 fire. *Electrical Panels & Conduit*: Electrical panels and conduit on the first and second floors are posted as "Contamination Areas" due to the 1969 Pu fire. *Soil Contamination*: Soil contamination under the building is expected from two sources: Fire water used to extinguish the 1969 fire and ground water fluctuations resulting in seepage of contaminated ground water from surrounding IHSSs into the soil. *Ventilation*: Zone IA ventilation system contamination levels are assumed to be $>10^6$. *Buried Equipment*: Contaminated equipment was buried in various locations under the floor after the 1969 fire; contamination levels are assumed to be $> 10^6$ cpm. B730 - Radiological contamination remains from radioactive solutions previously stored in the B730 Pit.
Be Contamination*	B776/777 - Be contamination is present due to machining, welding, handling and storage of Be parts. B730 - None identified.
ACM**	B776/777 - Present or potentially present in floor and ceiling tiles, mastic under floor tiles and carpet, walls, piping and equipment insulation, and roof tar. B730 - None identified.
Lead & Other Heavy Metals	B776/777 - Lead is present or potentially present throughout the facility in the following items: lead aprons, lead tape, leaded glass, solder in printed circuit boards, lead shielding, leaded gloves, tank sludge, incandescent lights, and paint. Paint may contain other heavy metals in addition to lead. Mercury is present in sodium vapor lights, fluorescent lights, incandescent lights, thermostats, switches, magnahelics and other instrumentation. Barium is present in leaded glass and tank sludge. Chrome is present in FBI equipment and oil. Cadmium is present in sludge and oil in FBI tanks. Silver is present in tank sludge. B730 - None identified.
PCBs	B776/777 - PCBs are present or potentially present in fluorescent light fixtures, capacitors, oils, chlorinated solvents, and paint. B730 - None identified.
SNM Holdup	B776/777 - SNM holdup is present in Zone I and IA ventilation systems and GBs. B730 - None identified.
Chemicals	B776/777 - Waste chemicals will be removed during deactivation. The exceptions are excluded chemicals and chemicals that will be used for decommissioning. Chemical solutions in tanks and piping will be sampled or characterized based on process knowledge during deactivation. B730 - None identified.
Radioactive Sources	B776/777 - Selective Alpha Air Monitors, Continuous Air Monitors, and radiological instrumentation needed on a daily basis are the sources that will be in the building during decommissioning. B730 - None identified.

Source: Table 2 of the Building 776/777 Cluster Reconnaissance Level Characterization Report

* Survey results and maps identifying contamination locations are presented in the RLCR.

** Sample results are presented in the RLCR.

This page has been left blank due to classification issues.
Personnel with access to UCNI may obtain this information
from the Building 776/777 Closure Project Manager.

Figure 5. Ground-Penetrating Radar Survey Locations (Building 776/777)

Another area in Room 127 (SET 68), (Area B), was investigated due to ongoing problems with the floor. During a maintenance job to repair the floor in late 1994, the concrete appeared soft. As the floor was scraped to remove paint, high levels of contamination developed along with a "puff" of air, and the maintenance crews encountered what they believed were metal plates. Based on the radar images of this area, there does not appear to be anything buried under the floor. However, the radar cannot penetrate a metal plate, so this area will be left as a suspect area of concern for planning purposes for future Site remediation.

4.3.3 In-Process Characterization

In-process characterization is required to prepare appropriate work authorization (WA) documents such as Radiological Work Permits (RWPs) required by the Site Radiological Control Manual (Ref. 10), and Activity Hazard Analyses (AHAs) required by the Integrated Work Control Program (IWCP) Manual (Ref. 11). Information collected for this purpose may also be used to further characterize the facility and provide background information for final building surveys.

In-process characterization is typically completed shortly before a work activity is initiated to ensure conditions have not changed since the planning stage. As work progresses and contaminants and hazards are eliminated, further characterization is completed to verify that contaminants and hazards have been removed to acceptable levels.

In-process characterization may be based on process knowledge. Field samples and/or radiological surveys are required for materials and processes that cannot be characterized adequately using process knowledge. Sampling and analysis activities are initiated through work packages for each SET prepared under the IWCP (see Section 5). Information collected during the RLC and pre-job walkdowns will be used to determine when sampling is required for a SET.

Recommended in-process characterization activities for Buildings 776/777 and 730 are presented in

Table 4. The following paragraphs provide an overview of how in-process characterization will be performed for lead and other heavy metals, liquids, PCBs, asbestos, radiological contamination, and Be. Appendix A describes the specific characterization required for each SET, as well as the unique hazards that may be present in each SET.

4.3.3.1 Lead and Other Heavy Metals

Lead and other heavy metals are present or potentially present throughout Building 776/777 in paint and in various equipment and insulation. Analysis for lead and other heavy metals in paint is not required in some cases. Available data from RFETS allows characterization of the non-radioactive lead based paint (LBP) debris generated in Building 776/777 as non-hazardous under RCRA, and amenable to disposal as sanitary waste per RFETS guidelines. However, as a best management practice, workers in the Building 776/777 Cluster will assume the debris contains lead unless either process knowledge (e.g., paint color) or analytical data (e.g., X-ray fluorescence, lead paint detector swabs) establish it is not a hazard to worker health.

Similarly, LBP debris in radioactive areas may be managed as LLW or TRU waste (i.e., non-mixed waste), except for high contamination areas where lead paint may have been liberally used as a fixative for radiological contamination. Paint debris from thickly painted high contamination areas will be managed RCRA hazardous LBP debris (i.e., LLM or TRM waste) unless total lead or

Table 4. In-Process Characterization Required for Contamination and Hazards in Buildings 776/777 and 730

CONTAMINANT	HAZARDS
Radiological Contamination	B776/777 - *Building Structure*: In-process surveys are required to confirm the contamination levels. *Equipment*: In-process surveys and final equipment assays are required to determine if equipment will generate LLW or TRU waste, or if it can be free-released. *Process Tanks and Piping*: Process knowledge and in-process samples from solutions being drained from tanks and building systems during deactivation will confirm contamination levels within the piping and will be used to determine if additional information is needed to support decommissioning activities. *Electrical Panels & Conduit*: In-process characterization is required to confirm internal contamination levels. *Soil Contamination*: Environmental restoration personnel will assume responsibility for developing characterization plans for soil contamination. *Ventilation*: SNM holdup scans will be used to select decontamination/waste disposal methods for Zone I and IA ventilation systems. *Buried Equipment*: Contaminated equipment was buried in various locations under the floor after the 1969 fire; contamination levels are assumed to be > 10^6 cpm. B730 - In-process surveys are required to confirm contamination levels.
Be Contamination	B776/777 - In-process surveys are required to confirm Be contamination levels in storage, handling, and production areas. B730 - In-process surveys are required to confirm Be contamination levels.
ACM	B776/777 - In-process sampling may be required to determine if asbestos is present in roof tar and cement block insulation. Mapping will be used to determine if asbestos is present in ceiling and floor tiles. If materials cannot be mapped to known asbestos containing material, material will be sampled. Pipe and equipment insulation are assumed to contain asbestos; no additional sampling is required to determine if insulation contains asbestos. B730 - No in-process surveys will be required.
Lead & Other Heavy Metals	B776/777 - In-process sampling may be required to determine the presence of lead and other heavy metals in incinerator equipment and insulation. Sampling for lead and other heavy metals in paint may be required per guidance in Section 4.3.3.1. Sodium vapor, incandescent and fluorescent lights containing heavy metals will be managed as hazardous waste and do not require further sampling. Items known to contain lead and other heavy metals (i.e. leaded gloves) will be managed as hazardous waste, and no additional sampling is required. B730 - No in-process surveys will be required.
PCBs	B776/777 - Characterization may be required to determine if PCBs are present. If equipment is painted and is destined for distribution in commerce (for recycling or reuse) characterization for PCBs in the paint will be required. PCB liquids, PCB items, or others waste known to contain PCBs at greater than 50 parts per million (ppm) will be managed as PCB waste. B730 - No in-process surveys will be required.
SNM Holdup	B776/777 - No in-process sampling required in addition to the scans already planned to meet safeguards and security requirements for SNM removal. B730 - No in-process surveys will be required.
Chemicals	B776/777 - No in-process sampling is required. Most containerized chemicals will be removed during deactivation. Chemical solutions will be drained from tanks during deactivation. Newly discovered waste chemicals and/or those chemicals removed from excluded areas will be managed under the waste chemical program or as process waste, whichever is applicable. B730 - No in-process surveys required.
Radioactive Sources	B776/777 and B730 - No in-process characterization will be required.

Source: Table 6 of the Building 776/777 Reconnaissance Level Characterization Report

Toxicity Characteristic Leaching Procedure (TCLP) measurements on a representative core of material establish the material is not RCRA hazardous waste.

Equipment known to contain lead or other heavy metals will be managed as hazardous waste and not sampled. The FBI insulation and equipment will be sampled for chromium. A chromium-based catalyst that was used in the FBI process has been removed, but there are visible stains from the catalyst on the insulation.

4.3.3.2 Liquids

Organic liquids drained from process systems will be characterized by process knowledge or sampled and analyzed for RCRA D-codes and F-listed solvents, TCLP organic constituents, pH, heavy metals, flashpoint, and PCBs, as appropriate. This data will generally be collected during deactivation in preparation for decommissioning.

Aqueous liquids drained from process and utility systems will be sampled in accordance with the requirements of the approved disposal facility. Liquids will be managed in accordance with RCRA/CHWA and associated implementing regulations.

4.3.3.3 Polychlorinated Biphenyls

In most cases, the location of PCBs was documented during the RLC. However, during decommissioning, PCBs may be found in fluorescent light fixture ballasts, capacitors, and paint. Ballasts and capacitors will be managed as PCBs if they are not specifically marked with the label "No PCBs." Ballasts containing PCBs will be managed as PCB bulk product waste as defined by Toxic Substances Control Act (TSCA), (Ref. 12), and capacitors containing PCBs will be managed as PCB items as defined by TSCA.

PCBs in applied dried paint are considered PCB bulk product waste as defined by TSCA. Generally, under TSCA regulations, characterization for PCBs in applied dried paint is not required to enable disposal. The regulations permit the disposal of certain PCB bulk product waste, including applied dried paints, in a permitted solid waste landfill regardless of the PCB concentration, provided proper notification is given to the facility.

However, painted equipment that is destined for recycle or reuse and has a significant recovery value must be characterized for PCBs to meet TSCA requirements for distribution into commerce. If the PCB concentration in the paint on the equipment exceeds 50 ppm, the equipment must be decontaminated before being reintroduced into commerce. The decision to reintroduce the equipment into commerce or to dispose of the equipment is based primarily on a comparison of the cost to decontaminate the equipment versus the recovery value of the equipment. If the cost of decontamination exceeds the recovery value of the equipment, the equipment will be disposed of in a solid waste landfill in accordance with TSCA requirements, without the need to characterize the PCB concentration in the paint. Additional details on decontamination requirements related to the management of PCB bulk product waste are provided in the Environmental Leadership Team Environmental/Waste Compliance Guidance No. 25, entitled "Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition" (Ref. 13).

4.3.3.4 Sampling and Analysis Methodology for Lead and Other Heavy Metals, PCBs, and Solvents

The documents identifying sampling protocols for lead and other heavy metals, PCBs, and solvents in liquids and/or solids are the facility Waste Stream and Residue Identification Characterization (WSRIC) Book, (Ref. 14), the process-specific Waste Generator Instruction (WGI), (Ref. 15), and the disposal facility waste acceptance criteria (WAC). A request for sampling and analysis is made to the analytical projects organization using a sampling and analysis request form. Sampling and analysis methodologies are determined by the analytical projects organization and based on the most recent Occupational Safety & Health Administration (OSHA), National Institute of Occupational Safety and Health (NIOSH), and EPA procedures, as appropriate.

4.3.3.5 Asbestos Containing Material

Whenever possible, flooring, ceiling tiles, mastic under tile and carpet, and roof tar will be characterized by a "mapping" process, which consists of an examination of asbestos sample results of material from one area, and the application of those results to similar material in another area. Additional samples will be collected if mapping cannot provide sufficient information.

The pipe insulation in Building 776/777 was burned during the 1969 fire or removed during decontamination and replaced with asbestos insulation. Therefore, insulation in the facility will be managed as asbestos waste. No further sampling is required to determine if the insulation contains asbestos.

Most walls in the facility have been characterized based on construction drawings and physical walkdowns to verify materials. Transite walls will be managed as asbestos waste. In addition, asbestos has been found in the cement brick insulation in other buildings across the Site. Samples of cement brick insulation in Building 776/777 will be analyzed to determine if asbestos is present in the insulation.

In-process characterization for asbestos will be conducted using approved Site procedures based on CDPHE requirements.

4.3.3.6 Radiological Contamination

Radiological surveys will be conducted on equipment, waste, and structures throughout the decommissioning process. These in-process surveys will be performed in accordance with approved radiological safety procedures based on the current version of the RFETS Radiological Control Manual (Ref. 10). Radiological surveys on equipment and waste are required to determine disposal paths. Structures will be surveyed for removable and total contamination. In addition, volumetric and/or surface media samples may be obtained to further characterize the structures.

4.3.3.7 Beryllium Contamination

Areas where Be operations were performed have been documented in the RLCR. In-process characterization will be conducted in accordance with the Chronic Beryllium Disease Prevention Program, (Ref. 16).

4.4 Building and Equipment Cleanup Levels

The following paragraphs identify the cleanup criteria that will be used to determine when materials, media, equipment, floors, walls, and ceilings within the Building 776/777 Cluster may be considered non-radioactive, non-hazardous, non-Be contaminated, non-TSCA, and non-ACM, then either free-released or managed as sanitary waste. These release criteria are taken from the DDCP (Ref. 4), which describes the requirements for characterizing the radiological and chemical hazards associated with buildings and facilities. The release criteria are summarized in Table 5. Except where pre-empted by new statutory, regulatory, and/or Site requirements, the release criteria will be used to disposition waste during decommissioning,

Table 5. Release Criteria

Contaminant	Regulatory Driver	Free-Release Threshold		
Radionuclides - values are above background concentrations in dpm/100 cm^2		Total Average	Total Maximum	Removable
Transuranics	DOE Order 5400.5	100	300	20
Th-Natural		1000	3000	200
U-Natural		5000	15000	1000
Beta-Gamma emitters		5000	15000	1000
Tritium		N/A	N/A	10000
RCRA Waste	6 CCR 1007-3, Part 261	No listed hazardous waste or characteristic hazardous waste is present		
Beryllium	RFETS Chronic Beryllium Disease Prevention Program	Loose surface contamination concentrations are less than 0.2ug/100 cm^2		
PCBs	40 CFR 761.62 (Federal Register, Vol. 63, No. 124, June 29, 1998)	95% Upper Confidence Limit (UCL) of the mean value of a representative sample for a given waste population does not exceed 50 ppm		
ACM	5 CCR-1001-10, Regulation No. 8	No sample in a sample set representing a homogeneous medium results in a positive detection (i.e., > 12% by volume)		

4.4.1 Radionuclides

When radiological contamination is identified, 10 CFR 835, (Ref. 17), and DOE Order 5400.5, (Ref. 18), will be followed to ensure protection of workers, the public, and the environment. If all radiological survey measurements are below the surface contamination thresholds provided in DOE Order 5400.5 (Ref. 18), the related area or volume of material is considered sanitary waste and may be free-released. If all radiological sample measurements are below the volume contamination thresholds provided in DOE Order 5400.5, the related volume of material is considered sanitary waste and may be free-released.

4.4.2 Hazardous Waste

If waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, it is considered hazardous waste in accordance with 6 CCR 1007-3, Part 261,

Identification and Listing of Hazardous Waste (Ref. 19). Otherwise, the waste is considered non-hazardous.

If the waste is hazardous waste, it will be disposed of in compliance with 40 CFR Part 268, Land Disposal Restrictions (LDRs), (Ref. 20), and in conformance with the disposal facility's WAC.

4.4.3 Beryllium Contamination

If Be contamination is detected in the form Be powder, the contaminated material will be handled as a hazardous waste (EPA Code P015), subject to treatment standards under 40 CFR 268.40 or alternate release criteria will be proposed based on surveys and available information.

If loose surface contamination concentrations of Be exceed the action level for equipment release defined in Section 28 of the RFETS Occupational Safety & Industrial Hygiene Program Manual, the contaminated material will be managed under the RFETS Chronic Beryllium Disease Prevention Program (Ref. 16).

4.4.4 Polychlorinated Biphenyls

If a material meets the definition of "PCB bulk product waste," it may be disposed of as TSCA waste at a permitted solid waste disposal facility without further characterization. If the disposal facility is not an approved commercial PCB storage or disposal facility, the generator must provide written notification to the facility in accordance with 40 CFR 762.62.

If a material meets the definition of "PCB remediation waste" (i.e., potentially containing PCBs from historical releases), the free-release concentration is 1 ppm PCBs, as determined in accordance with the requirements of 40 CFR 761.61, Subpart G. Higher release levels for PCB remediation waste are permissible, but carry specific restrictions on how the material may be dispositioned.

4.4.5 Asbestos Containing Material

ACM will be managed in compliance with 5 CCR-1001-10, Regulation No. 8. If any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., > 1% by volume), the material is considered ACM; otherwise the material is considered non-ACM.

ACM that is friable or will be made friable during demolition activities will be removed prior to demolition. An asbestos removal action will be considered complete when, based on five air samples ($\geq$1,199 liters/sample for a 25 millimeter filter or $\geq$2,799 liters/sample for a 37 millimeter filter), the average concentration of asbestos, as analyzed by transmission electron microscopy, does not exceed 70 asbestos fibers/mm^2.

4.5 Closure of RCRA-Regulated Units

RCRA-regulated units located within the Building 776/777 Cluster will be closed in compliance with the closure performance standards described in this section. Table 6 presents a list of the RCRA-regulated units in the Building 776/777 Cluster, including unit number and associated SET number, location, permit status, the type of closure currently planned for each unit, and the scheduled closure times for the tank units.

Closure activities for RCRA-regulated units located in the basement of Building 776/777 will begin during deactivation and decommissioning, but may not be completed until environmental restoration. Details concerning the disposition of the basement foundation/slab will be provided in a subsequent decision document(s), which may include a modification to this DOP.

4.5.1 Closure Options

Closure may be conducted in two stages: first by rendering a unit or portion of a unit "RCRA stable" (if a permitted or interim status unit) or "physically empty" (if a mixed residue unit), then by completing the activities associated with the closure options described below.

4.5.1.1 Clean Closure

RCRA-regulated units may be "clean closed" either by documenting the absence of contamination or by decontaminating the unit. For units having a complete, detailed operating history, clean closure will be demonstrated when the following criteria are met:

- An administrative review of the RCRA Operating Record indicates hazardous or mixed waste was never spilled in the unit, or if a spill did occur, it was cleaned up and the spill area was decontaminated; and
- A visual inspection of the unit and associated ancillary equipment notes an absence of hazardous or mixed waste stains and/or residuals.

Units to be "clean closed" by decontamination will be flushed and washed with a suitable decontamination solution to remove visible waste residuals and contaminants of concern, then rinsed with clean water. The final rinsate will be tested to determine whether:

- The pH of the rinsate is between 6 and 9, and
- The concentrations of priority pollutants and heavy metals identified as being managed in the unit are below the Tier 2 standards for ground water (i.e., the maximum contaminant levels [MCLs]) defined in Attachment 5 of RFCA [Ref. 1], and listed in Appendix C). Rinsate meeting the MCLs for listed waste constituents associated with the unit and the LDR standards for characteristic waste will be deemed to be "no longer contained in" and will be managed as LLW.

For external surfaces, the final rinsate will not exceed a volume of two gallons per 100 ft^2 of surface area rinsed, and for internal surfaces, the final rinsate will not exceed a volume of 5% of the capacity of the tank system. If test results indicate the standard has been met, the unit equipment will be considered "clean closed." In the event the standard is not met, the LRA will be consulted to determine whether the results are protective of human health and the environment. Unit equipment or structures that cannot be decontaminated to meet the performance standard will be removed or addressed during environmental restoration.

Table 6. Building 776/777 RCRA-Regulated Units

Room	RCRA Unit	SET	Description	Status	Proposed Closure ∅
134	776.1	67	Container Storage Area	Permitted	RCRA Stable/ Defer until IHSS Remediation
134 (ASRF)	776.1	66	Container Storage Area (ASRF)	Permitted	RCRA Stable/Defer until IHSS Remediation
154	776.1	54	Container Storage Area	Permitted	RCRA Stable/ Defer until IHSS Remediation
159	776.1	57	Container Storage Area	Permitted	RCRA Stable/ Defer until IHSS Remediation
237	776.1	70	Container Storage Area	Permitted	RCRA Stable/ Removal
208	776.1	70	Container Storage Area	Permitted	RCRA Stable/ Removal
127	776.1	68	Container Storage Area	Permitted	RCRA Stable/ Defer until IHSS Remediation
127	776.2C	69	Process Waste Tank T-2A	Permitted	RCRA Stable (FY03)/ Removal (FY03)
127	776.2D	69	Process Waste Tank T-2B	Permitted	RCRA Stable (FY03)/ Removal (FY03)
127	776.2A	69	Process Waste Tank T-1A	Permitted	RCRA Stable(FY03)/ Removal (FY03)
127	776.2B	69	Process Waste Tank T-1B	Permitted	RCRA Stable (FY03)/ Removal (FY03)
134	776.3	66	ASRF (Treatment)	Permitted	RCRA Stable/ Removal
118	44.01	62	Oil Storage Tank T-2	Interim Status*	RCRA Stable (complete)/ Removal (FY00)
118	44.02	62	Oil Storage Tank T-1	Interim Status *	RCRA Stable (complete)/ Removal (FY00)
118	49.01	63	FBI Production Unit (Treatment)	Interim Status	RCRA Stable/ Removal
135	49.02	61	FBI Pilot Unit (Treatment), including Tanks T-1 & T-2	Interim Status*	RCRA Stable (FY00)/ Removal (FY02)
146	61	60	SRV (Storage)	Interim Status	RCRA Stable/ Removal
146	61	60	SRV (Treatment)	Interim Status	RCRA Stable/ Removal
134	74	64	SARF	Interim Status	RCRA Stable/ Removal
152	90.85	53	Container Storage (Vault)	Mixed Residue	RCRA Stable/ Defer until IHSS Remediation
1	90.99	68	Container Storage (Basement)	Mixed Residue ⊕	RCRA Stable/ Defer until IHSS Remediation
134	94.001	55	Tank SRV-3	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY00)
134	94.002	55	Tank SRV-4	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY00)
134	94.003	55	Tank SRV-5	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY00)
134	94.005	66	Tank T-344	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY03)
134	94.006	66	Tank T-345	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY03)
134	94.007	52	Tank T-360	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY01)
134	94.008	52	Tank T-370	Mixed Residue ⊕	Physically Empty (FY00)/ Removal (FY03)
146	94.009	60	Ball Mill Washer (Treatment)	Mixed Residue ⊕	Physically Empty (FY02)/Removal (FY02)
146	94.010	60	Collection Pan	Mixed Residue ⊕	Physically Empty (FY02)/Removal(FY02)
146	94.011	60	Annular Tank	Mixed Residue ⊕	Physically Empty (FY02)/ Removal (FY02)

Room	RCRA Unit	SET	Description	Status	Proposed Closure ∅
432C	777.1	27	Container Storage	Permitted	RCRA Stable/ Defer until IHSS Remediation
430 (3)	777.1	25	Container Storage	Permitted	RCRA Stable/ Defer until IHSS Remediation
430 (2)	777.1	25	Container Storage	Permitted	RCRA Stable/ Defer until IHSS Remediation
483 (8)	777.1	47	Container Storage	Permitted	RCRA Stable/ Defer until IHSS Remediation
433	777.1	31	Container Storage	Permitted	RCRA Stable/ Defer until IHSS Remediation
208	777.1	70	Container Storage	Permitted	RCRA Stable/ Removal
448	777.1	32	Container Storage (NDT)	Permitted	RCRA Stable/ Defer until IHSS Remediation
430	95.015	26	Tank T-1	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY00)
430	95.016	26	Tank T-2	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY00)
131	90.49	8	Container Storage	Mixed Residue ⊕	RCRA Stable/ Removal
131	95.006	7	Tank 1103	Mixed Residue ⊕	RCRA Stable (complete / Removal (FY00)
131	95.007	7	Tank 1104	Mixed Residue ⊕	RCRA Stable (complete)/ Removal (FY00)
131	95.008	7	Tank 1106	Mixed Residue ⊕	RCRA Stable (complete)/ Removal (FY00)
134E	95.014	11	Tank T-7	Mixed Residue ⊕	RCRA Stable (complete)/ Removal (FY02)
131	N/A	4	Tank DL-776	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY02)
131	N/A	4	Tanks V-605 (2)	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY02)
131	N/A	5	Tank V-614	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
131	N/A	5	Tank V-616	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
131	N/A	5	Tank V-618	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
131	N/A	5	Tank V-620	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
131	N/A	6	Tank V-626	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
131	N/A	6	Tank V-627	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
452	N/A	34	Tank V-022	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
452	N/A	36	Tank V-543	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
134E	N/A	11	Tank V-746	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
134E	N/A	11	Tank V-747	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY01)
134E	N/A	11	Tank V-748	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY02)
134E	N/A	11	Tank V-749	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY02)
134E	N/A	10	Tank V-752	Mixed Residue ⊕	Physically Empty (FY99)/ Removal (FY02)

* Interim status tank Units 44.01, 44.02, and 49.02 are governed by the terms and conditions of the Hazardous Waste Tank Management Plan (HWTMP), which required the tanks to be taken to a RCRA Stable status by March 31, 1998. This commitment was met.

⊕ Mixed residue tanks are governed by the terms and conditions of the Mixed Residue Tank Plan.

∅ The type of closure for a unit may change from the type of closure listed; however, all closures will be conducted in accordance with this DOP.

N/A Mixed residue tank does not have a unit number.

4.5.1.2 Unit Removal in Conjunction with "Debris Rule" Treatment

Alternatively, RCRA-regulated units may be closed by removal and treatment under the "debris rule." The "debris rule" applies to unit equipment or structures that have no intended use or reuse, and are slated for removal and discard. To meet the "debris rule" standard, decontamination will be conducted using the "abrasive blasting" physical extraction technology, or other appropriate

technology identified in Part 268.45 of 6 CCR 1007-3 (Table 1, Alternative Treatment Standards for Hazardous Debris).

If, after "debris rule" treatment, the equipment or structure meets the standard for a "clean debris surface," and it does not exhibit a hazardous waste characteristic, it will no longer be considered a hazardous waste and will be managed as a solid waste.

In the event the standard is not met, the equipment or structure will be removed and managed as hazardous or mixed waste. Treatment residuals generated from extraction and/or destruction technologies used in the closure of units in the Building 777/776 Cluster (including rinsates) will be characterized in compliance with 6 CCR 1007-3, Part 262.11, and managed accordingly. Treatment residuals do not meet the definition of debris.

4.5.1.3 Unit Removal without Onsite Treatment

Unit equipment or structures that are not decontaminated to meet either the "clean closure by decontamination" or "debris rule" standard will be removed, size-reduced (if necessary), and packaged to meet the waste acceptance criteria (WAC) of the approved disposal facility. In the event this waste cannot be shipped directly to a disposal facility, it will be stored in an approved on-Site storage unit until shipment can be scheduled.

4.5.2 Closure Documentation

Prior to the decommissioning of each SET, RCRA unit-specific closure information will be submitted to the LRA for review and approval as a minor modification to the DOP under paragraph ¶127 of RFCA (Ref. 1). The unit-specific information will include drawings and/or photographs of the RCRA-regulated unit or units in the SET, applicable EPA Waste Codes, the selected closure option(s), and closure requirements.

A description of the closure activities completed for each RCRA-regulated unit will be included in the Final Closeout Report, which will be prepared for the Building 776/777 Closure Project upon completion of decommissioning activities. Units failing to meet the closure performance standards (i.e., units that cannot be decontaminated or removed) will be addressed during environmental restoration.

4.6 Final Status Survey

A final status survey will be conducted to identify areas requiring decontamination before the building is demolished. The final status survey will be performed on an on-going basis in areas that have been stripped out and released for final survey to verify the waste disposal path for building rubble. Per RFCA paragraph 60 (a), the LRA may take samples and obtain duplicate, split or sub-samples of DOE samples.

The final status survey will be conducted in accordance with the Final Status Survey Plan, which will be prepared in conformance with the DDCP (Ref. 4) prior to the initiation of demolition activities. The Final Status Survey Plan will be submitted to the LRA for review and approval. A Final Status Survey Report will be prepared to document the results of the final status survey and included in the Project's administrative record (AR). The Final Status Survey will be forwarded for review to the LRA per the DPP, sections 3.3.10 – 3.3.13.

4.7 Independent Verification

An independent party, selected by DOE, will perform a verification assessment of the final survey methodology. This assessment will include a review of survey procedures, survey instrument calibration and operation procedures, and the Final Status Survey Plan. Also, the independent party may obtain additional survey measurements for comparison with the RFETS measurements to ensure proper correlation of survey data.

4.8 Endpoints

Once the characterization walkdowns were completed, detailed endpoints were developed for each SET. The endpoints determine the completion criteria for the SETs. Distinct activities required to deactivate, isolate and contain, dismantle, size reduce, and package waste for off-site shipment are included as endpoints. Although the endpoints were developed based on walkdowns, it is expected additional work will be discovered during decommissioning. The scope of work and associated endpoints will be adjusted as items are identified. The endpoints are intended to provide the basis for the activities and activity line items in the Work Breakdown Structure (WBS) and milestones on the project schedules. The endpoints are divided into three categories: deactivation, decommissioning, and project management. Appendix A contains a master list of decommissioning endpoints for each SET. Documentation of the endpoints ensures all parties understand what is involved in the decommissioning phase of the SET, and activities are signed off as they are completed as part of the IWCP process (see Section 5) to document that applicable criteria have been met. The endpoints or milestones listed in this DOP are provided for information only.

4.9 Size Reduction Methodologies

In Building 776/777, size reduction activities will involve 279 GBs, connecting stations, and centerlines, along with 44 tanks. The GBs and tanks are connected to the Zone I ventilation systems totaling several miles of ductwork and piping. The GBs are stainless steel enclosures with window mountings, glove port rings, bolted flanges, and various penetrations attached to the walls. The tanks range from five inches to a few feet in diameter and up to a few feet long. These vessels were fabricated in both single-wall and double-wall configurations. Zone I exhaust systems are made up of 6-inch to 36-inch diameter stainless steel ductwork and walk-in plenums containing HEPA filters.

For disposal, the GBs, tanks, and ventilation system hardware must be reduced in size to fit into waste containers for disposal. The primary containers for TRU waste are Waste Isolation Pilot Plant (WIPP) standard waste boxes (SWBs) and 55-gallon drums. During size reduction, items are cut into pieces or slabs that can be stacked efficiently in the waste containers.

A value engineering study performed by the Technology Steering Committee in July of 1998 evaluated a variety of size reduction techniques that may be used on equipment and GB systems in the Building 776/777 Cluster. Results of this study are summarized in Table 7. The selected methods will depend on the individual areas and the type and location of equipment to be size reduced. In some cases, the preferred method may not be used due to safety constraints, such as criticality evaluations or area specific limitations in the Building 776/77 AB. Cutting methods will be finalized for each SET as the detailed IWCP work packages are developed.

Table 7. Proposed Size Reduction Techniques

Methods	Small Tools	Plasma Arc	Oxy-torch	Laser Cutter	Diamond Wire Saw	Wachs Cutter	Hydraulic Shears	Shear Baler	Water with Abrasives	Upgrade ASRF	ASRF	Arc Saw	Arc Air Slice	Arbor Press
Footnotes	I	A,R,H,F	A,R,H,F	A,H	C,R,S	P	R		A,C,S,H			A,H,F	A,H,F	
GBs							1	1	1	1				
Stainless with lead shielding	3	1		2	3		1	1	1	1	1	1	1	1
Stainless without lead shielding	2	1		2	3		3			1	1	1	1	1
Plexiglas with lead shielding	1						3							
Plexiglas with lead shielding	1									1	1			
Glass	1									1	1			
Lead	1									1	1			1
Gloves	1									1	1			
Filters	1									1	1			
GB supports	2	1	1	1		1	2		2			3	1	
Shielding														
Benelex	1													
Plexiglas	1													
Machinery														
Tool Steel														
<½ "	3	1	1	2	3				1	1	1	1	1	
> ½" but < 3"	3	1	1		3				1	1	1	1	1	
> 3"	3	1	1		3				3	1	1	1	1	
Cast iron		1		2	3				2	1	1	1	1	
Carbon steel equipment bases		1	1	2	3				2	1	1	1	1	
Aluminum	2	2		1	3		1	1	1	1	1	1	1	1
Stainless steel > 3/8" but < 1"	3	1		3	3				1	1	1	1	1	
Granite	2		2		1				1				2	

LEGEND:
Blank = Not applicable
1 = Most preferred method
2 = Medium preferred method
3 = Least preferred method

Footnotes
A = Can be automated
R = Can utilize remote control
H = Needs hard-sided containment
F = Fumes need to be dealt with
C = Possible criticality issue
S = Secondary waste issue
I = Includes use for disassembly
P = Applies to pipe only

Due to the requirement to operate within a controlled work environment at Rocky Flats, changes in the methods to accomplish size reduction goals will be implemented using a phased approach. Certain methods (e.g., thermal cutting) have been recommended for use inside hard-sided containment. The following types of hard-sided containment are being considered for use: a new system in Room 121, the existing ASRF in Room 134, portable containment (i.e., bolt together), and a centralized size reduction facility. The graded approach to size reduction is summarized as follows:

- Develop a hard-side/soft-side containment that does not require supplied breathing air on a continuous basis and tooling that reduces handling fatigue.
- Develop a remotely operated size reduction system within hard-sided containment to remove the operator from the actual size reduction activities (e.g., cutting, packaging) and improve throughput of a single size reduction system. The safety goal is to completely remove the human operator from actual size reduction activities.

Both these approaches to size reduction in the Building 776/777 Cluster will incorporate technology improvements associated with an enhanced walk-in hard-sided containment system to reduce or eliminate Class "A" PPE. Technology improvements are primarily limited to currently proven and available equipment and processes. This will provide technology that will be available to meet existing goals for size reduction tasks in Building 776/777. The Technology Steering Committee will continue to work on the identified needs and define future improvements for RFETS decommissioning activities. In addition, the committee will provide guidance on integrating currently funded activities into Site closure projects and programs.

4.10 Decontamination Approach

Material and equipment located in the Building 776/777 Cluster must be dispositioned into various categories of excess equipment and waste. During FY00 an Economic Disposal Plan will be developed in accordance with 1-MAN-009-PMM, Property Management Manual (Ref. 21). As illustrated in Figure 6, this logic is used to determine if a material is waste or property, and if it may be readily free-released as uncontaminated and non-hazardous material. If it is radioactive and/or hazardous waste, the material must be evaluated for whether, after packaging, it is TRU, TRM, LLW, or LLM waste. If it is TRU or TRM waste, the effort to be expended for decontamination and volume reduction to optimize its final configuration must be determined and documented. Once segregated, characterized, and packaged, the waste will be disposed of based on RFETS waste management requirements.

A recent study, entitled "Evaluation of Potential Cost Impacts from Volume Reduction and Decontamination for TRU Contaminated Systems and Equipment," (Ref. 22), provided the following conclusions on the economics of volume reduction and decontamination. First, for most systems, volume reducing to increase the average density of the filled waste containers provides insufficient waste management cost savings to justify the additional labor needed to cut items into smaller pieces to achieve the higher density. Second, decontaminating TRU-contaminated systems and equipment to LLW also does not appear to be cost effective for most systems. Finally, schedule delay costs add to the cost of decontamination or additional volume reduction and can be much larger than any other factor. An analysis of Building 779 Closure Project revealed the cost impacts

due to schedule delays. A schedule slip of one day resulted in a cost increase of up to $85,000, which is the current rate of spending for the Building 776/777 Closure Project. Schedule delays in the decommissioning of other Pu buildings could run two to three times this amount. Schedule delay costs can dominate the economics of decommissioning for those systems on the critical path to a building's closure. For these systems, the most straightforward method of removal and disposition will be chosen.

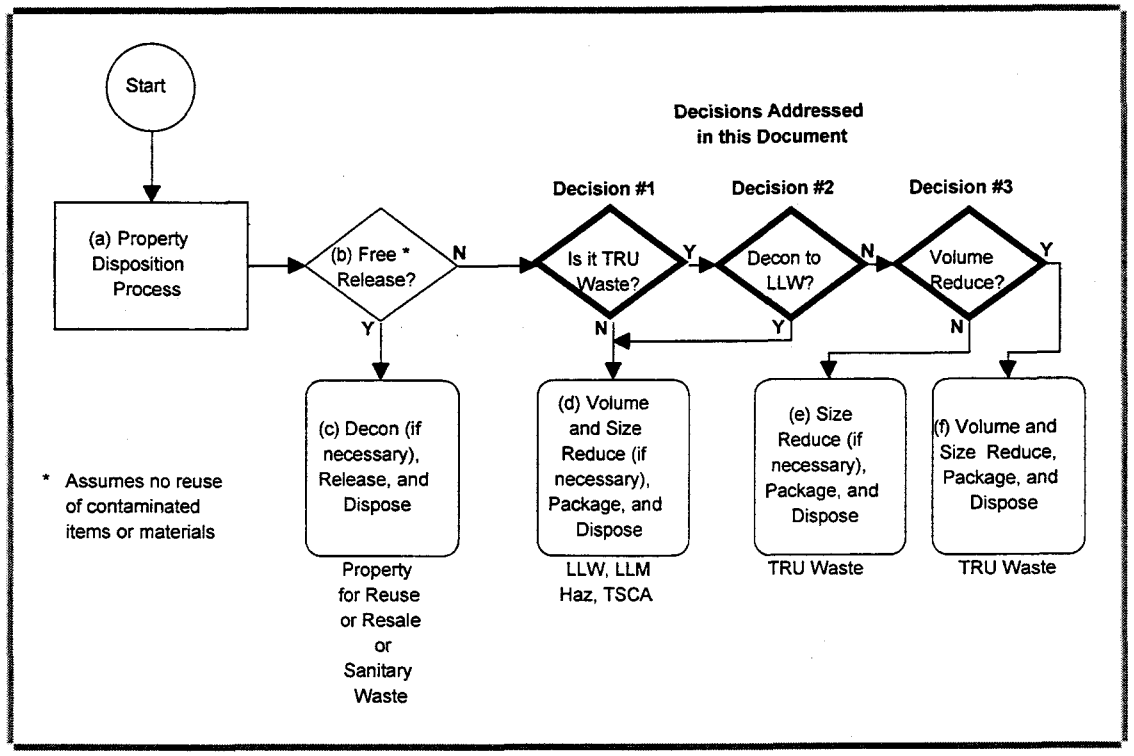

Figure 6. Waste Decision Logic

The following paragraphs describe the techniques most likely to be used if equipment and surfaces must be decontaminated. These techniques are listed in the Building 776/777 Complex Basis for Interim Operation (BIO), (Ref. 23). Techniques not currently authorized by the BIO may be introduced through an IWCP work package (Ref. 11), then evaluated by the Unreviewed Safety Question Determination (USQD) process (Ref. 24) prior to implementation.

4.10.1 Dusting, Wiping, and Scrubbing

Dusting, wiping, and scrubbing involve the physical removal of dust and fine particles from building and equipment surfaces using common cleaning techniques. Typically, dusting is a dry technique where a dry cloth is used. Wiping involves the use of a damp cloth, which may be soaked with water, detergent, or solvent to assist in removing particulates. Scrubbing is similar to dusting and wiping except that pressure is applied to assist in removing the contamination.

4.10.2 Vacuuming

Vacuuming involves the physical removal of dust, particulates, and liquids with a suction device. Dust and particulates are removed using a commercial or industrial grade vacuum equipped with a HEPA filter. Liquids are removed using a "wet vacuum" equipped with an alternate filter system, because HEPA filters do not function properly with liquids.

4.10.3 Strippable Coatings

Strippable coatings may be applied to contaminated surfaces, then removed along with some of the contamination. Various agents can be used as strippable coatings for contaminated surfaces. Decontamination factors for the strippable coatings vary with the type of coating used. In general, strippable coating decontamination is only effective on smooth, non-porous surfaces.

Strippable coatings are applied using a mixture of two polymers that chemically react to form the coating. Usually, the contaminated layer is pulled off, containerized, and disposed of as contaminated waste. The polymers used in the mixture are often hazardous materials. Care must be taken when collecting the coatings to assure the quantities of radioactive material do not exceed the packaging requirements. The two strippable coatings being considered are identified in Table 8.

Table 8. Strippable Coatings

Coating Mixture	Coating Reaction
Polymer mixture	In the polymer mixture, contaminants are entrained in the mixture as the polymer reacts then stabilizes. The contaminated layer of polymer is pulled off, containerized, and disposed of as radioactive waste.
Nontoxic, water-based copolymer	The nontoxic, water-based copolymer is considered self-stripping because as the formula polymerizes, it cracks, flakes, and falls off, taking the loose surface material with it. The loose flakes are containerized with no additional processing prior to disposal.
Note: Combustible strippable coatings have not been considered.	

4.10.4 Fixative Coatings

Various agents may be used as coatings on contaminated surfaces to fix the contaminants in place and decrease or eliminate exposure hazards. The fixed contaminants are left in place to reduce potential spreading during other phases of closure. Fixatives will be used on a case-by-case basis, as identified during preparation of individual IWCP work packages.

One fixative coating technique that may be used involves a two-step process. An initial capture coating is applied using a misting technique. The capture-coating mist is similar to a gas and removes airborne contamination from the application area. The capture coating eventually settles onto exposed surfaces and becomes tacky. A second, durable coating is then applied using a mixture of two compounds that chemically react to form the coating. The two compounds have hazardous material classifications. One compound reacts violently with water and the other reacts violently with acids. Upon decomposition, either may emit noxious gases.

4.10.5 Scarifiers

Scarifiers physically abrade both coated and uncoated concrete and steel surfaces. The scarification process removes the top layers of contaminated surfaces to reach the sound, uncontaminated surfaces. For steel surfaces, scarifiers can completely remove contaminated coating systems, including mill scale. This leaves a surface of bare metal. A scabbling scarification process may be used to achieve the desired profile and results for contaminated concrete. A needle-scaling scarification process may be used for steel decontamination. Vacuum attachments may be used to reduce the spread of contamination associated with the scarification process.

4.10.6 Paving Breakers and Chipping Hammers

Paving breakers and chipping hammers are used to physically remove contamination and surface material by mechanical impact. Although paving breakers and chipping hammers are primarily used in demolition activities, they may also be used to remove surface contamination up to six inches thick, resulting in a rough remaining surface.

4.10.7 Grit Blasting

Grit blasting, also referred to as sand blasting or abrasive jetting, uses abrasive materials suspended in a medium (e.g., compressed air, water, or a combination of air and water) to pulverize and grind out surface contaminants. Typically, blasting results in a uniform abrasion of the surface. Typical abrasives include minerals, steel pellets, glass beads, glass frit, plastic pellets, and natural products, such as sand. A grit blasting system consists of a blast gun, pressure lines, abrasives, and an air compressor. Grit blasting systems are usually hand-held; however, remotely operated units are available.

4.10.8 Carbon Dioxide Blasting

Carbon dioxide (CO_2) blasting is a variation of grit blasting in which CO_2 pellets are used as the abrasive medium. Small CO_2 pellets accelerate through a nozzle using compressed air, shattering when they impact the surface. The resulting kinetic energy causes the shattered pellets to penetrate the base material and release the contaminant(s). The CO_2 fragments immediately sublimate, which adds a lifting force that aids in removal of the contaminant(s). Abraded debris falls to the ground, and the CO_2 (now a gas) returns to the atmosphere. The CO_2 blasting is effective with plastics, ceramics, composites, and stainless steel. This technique may not be effective on hard coatings that are firmly bonded to the base material.

4.10.9 Chemical Decontamination

Chemical reagents are widely used in the nuclear industry for decontamination. A major advantage of chemical decontamination is the production of few airborne hazards. Other advantages of chemical decontamination include:

- Use on inaccessible surfaces;
- Fewer work hours required;

- Process equipment and piping may be decontaminated in place; and
- Decontamination may be performed remotely.

Disadvantages include:

- Generation of large volumes of radioactive mixed waste, and
- Storage and collection concerns.

4.11 Building 776/777 Decommissioning

Building 776/777 will be decommissioned using a phased approach. The following paragraphs summarize the decommissioning activities that will be conducted to prepare the building for demolition. Demolition will proceed in accordance with a subsequent decision document(s), which may include a modification to this DOP.

4.11.1 Expected Condition of Building 776/777 at Beginning of Decommissioning

By the time decommissioning begins in Building 776/777, the majority of SETs will be deactivated and a few SETs will still be in a normal operating mode. Typically, in a deactivated SET, all classified material, loose combustibles, and hazardous materials have been removed and dispositioned; solutions in tanks, machines, pumps, and associated piping have been drained and dispositioned; and radioactive and chemical contamination has been controlled or fixed. Deactivation activities do not include draining utility and fire systems, disconnecting old electrical and ventilation systems, or deactivating alarms that are still in operation. This status is provided as general information only and is subject to change.

4.11.2 Building 776/777 Decommissioning Sequence

In general, the decommissioning sequence of the SETs in Building 776/777 will be as follows: GBs and B-boxes will be removed first so that Zone I ventilation can be removed. Process tanks will be removed during the same time frame as the GBs and used as "fill-in" work. After the GBs, B-boxes, process tanks, and Zone I ventilation systems have been removed, the remaining room decommissioning activities will take place. These include removal of interior walls, piping, ventilation, and electrical systems to approximately the eight-foot level or to the first tie point. At that time, samples may be taken beneath the paint on the floors and walls, between corrugated wall panels, and on the concrete decking on the first floor ceiling to identify the magnitude of fixed contamination. Depending on the sample results, additional decontamination may be required. Once the rooms have been emptied and sampling and/or decontamination has been completed, final radiological surveys will be performed on the floors and walls. Engineering and administrative controls will be used to prevent the spread of contamination to uncontaminated and/or decontaminated areas.

4.11.3 Building 776/777 Gloveboxes, B-Boxes and Hoods

Internal surfaces of GBs, B-boxes and hoods will be wiped down using materials such as disposable wipes and non-toxic cleaning solutions. Loose materials will be swept up, and a light abrasive

material will be used, as required. More aggressive techniques, such as grit blasting, may be used depending on the levels and location of contamination.

Based on radiological survey measurements, a strippable coating may be applied to fix surface contamination during size reduction operations. Where appropriate, the strippable coating may be applied and removed several times to reduce surface contamination levels.

In some cases, lead shielding affixed to the exterior surfaces of the GBs will be removed to minimize the generation of mixed waste. However, on GB lines where wet cutting or machining operations were conducted using organic solvents, and where the interior metal cannot be decontaminated to meet "clean debris surface" standard, lead may be left in place.

Internal equipment and components will be removed before the size reduction of GBs, B-boxes, or hoods. Depending on the layout of the SET, the size of the components being size reduced, and their contamination levels, containment may be erected around the SET or equipment, or the equipment may be moved to a designated size reduction containment area.

The containment structure will be equipped with HEPA filtration to prevent the spread of contamination and to minimize worker exposure. Tie-ins to the existing building Zone I ventilation system may be used if the airflow is adequate. If not, a portable air mover fitted with HEPA filters will be employed.

Working inside a containment structure, workers will reduce the size of the component using a variety of pre-approved cutting techniques, including small hand tools, nibblers, and saws. Size reduction will minimize waste volume and allow packaging in approved shipping containers.

Contamination surveys will be performed in the work area as SETs are removed. Areas with contamination above acceptable levels will be decontaminated or fixatives will be applied to fix contamination. The choice to decontaminate or fix contamination will be made on a case-by-case basis during the development of individual IWCP work packages.

4.11.4 Building 776/777 Large Equipment

Several large pieces of equipment, including the supercompactor, horizontal accelerator, rolling mills, metal presses, and various tanks, will also be size reduced to allow packaging in approved shipping containers. Successful techniques used to size reduce GBs will be adapted when appropriate. In some instances, equipment may be size reduced in place, then transferred to another containment structure for further size reduction.

4.11.5 Building 776/777 Ventilation Systems

The ventilation systems will be removed after their services have been disconnected. Each portion of ductwork to be removed will be sleeved in plastic and cut or unbolted. Alternatively, the area may be enclosed in a containment structure. If the internal surface contamination is below packaging limits, the internal surfaces of the ductwork will be coated with a fixative. If the internal surfaces are above the packaging limits, the internal surfaces will be decontaminated using wipes and abrasive cleaners.

The ductwork for each system will be removed starting at the point most remote from the HEPA filtration unit and fans for each leg of the system. The building ventilation fans will remain in

service and throttled down to the maximum extent possible during removal of the systems. Temporary air movers with HEPA filters will be used when necessary.

4.11.6 Equipment Buried Under Building 776/777

Areas containing buried equipment (SET 84) will be decommissioned by removal. Planning and engineering for this SET will be completed prior to decommissioning the SET. The individual IWCP work package(s) will describe additional confirmation methods and removal methods. This SET is not scheduled for decommissioning until FY03.

4.12 Building 730 Decommissioning

Building 730 is an underground process waste pit containing four Zone II plenum deluge tanks. Two of the four tanks have been filled with foam and remain in place. These tanks were previously used for solvent storage. It may be necessary to remove one of the tanks and install a temporary tank to support decommissioning activities. When the pit is no longer needed to support the Building 776/777 ventilation system, the tanks and entryway to the pit will be removed.

4.13 Waste Management

The waste management strategy for the Building 776/777 Closure Project is summarized in Section 6.

4.14 Work Controls

Work Controls are established through the Integrated Safety Management System (ISMS), as discussed in Section 5.

4.15 Effluent Controls

Specific air effluent controls are discussed in Sections 7.1 and 8.4. Water effluent controls are discussed in Sections 7.4. Spill response controls are discussed in Sections 5.5.1 and 5.10.

4.16 Authorization Basis

The Building 776/777 BIO (Ref. 23) will be the AB for closure activities. Specific operations to be covered by the BIO are decontamination of equipment and surfaces, dismantling and size reduction, demolition, and waste management. The BIO contains accident analyses and facility controls for deactivation activities that will be expanded in the next revision of the BIO. Revision 1 of the BIO is currently being implemented; Revision 2 (July 1999) will incorporate administrative control requirements; and Revision 3 or appropriate page changes (September 1999) will incorporate decommissioning activities. Future revisions will incorporate size reduction technologies, including robotics.

4.17 Performance Standard

The performance standard for the Building 776/777 Closure Project is to conduct work in a manner that protects the worker, the public, and the environment. This will be accomplished by following

established work practices and procedures described in Section 5 of this DOP, and by complying with the ARARs described in Section 7.

4.18 Records Disposition

Building 776/777 Closure Project records consist of the CERCLA Administrative Record, the RCRA Operating Record, the Project Record, and the Project Closeout Report.

4.18.1 CERCLA Administrative Record

Appendix D identifies the documents that constitute the Administrative Record (AR) for the Building 776/777 Closure Project. Upon completion of the public comment period, comments received from the public will be added to the AR file, along with the responsiveness summary and the LRA approval letter. LRA approval of this DOP constitutes approval of the AR file.

The following information repositories have been established to provide public access to the Building 776/777 Closure Project AR:

U.S. Environmental Protection Agency (EPA)
Region VIII
Superfund Records Center
999 18th Street, Suite 500
Denver, Colorado 80202-2466
(303) 293-1807

Citizens Advisory Board (CAB)
9035 Wadsworth Parkway
Suite 2250
Westminster, Colorado 80021
(303) 420-7855

Colorado Department of Public Health and Environment (CDPHE)
Information Center, Building A
4300 Cherry Creek Drive South
Denver, Colorado 80220-1530
(303) 692-3312

U.S. Department of Energy Rocky Flats
Public Reading Room
FRCC Library
3645 West 112th Avenue, Level B
Westminster, Colorado 80030
(303) 469-4435

4.18.2 RCRA Operating Record

RCRA records and closure documents will be maintained with the existing Building 776/777 RCRA Operating Record. Upon completion of the Building 776/777 Closure Project, the RCRA Operating Record will be transferred to Site Records Management for storage.

4.18.3 Project Record

Project-specific documents will be filed in the Project Record until final closure is complete, at which time the Project Record will be processed through Site Records Management and archived. The Project Record will contain characterization documentation, inventory sheets, project correspondence, comment resolution, IWCP work packages, and additional information that is a direct result of the work involved in the project. Maintaining the Project Record is a Site requirement.

4.18.4 Closeout Report

A Closeout Report will be prepared for the Building 776/777 Closure Project after work has been completed and analytical data received. The report will consist of a brief description of the work completed, including any modifications or variations from the original decision document. The report will also contain analytical results, including the results of confirmatory sampling, as well as a description of the quantity and characteristics of the waste generated and how the waste is stored or disposed.

The expected outline for the Closeout Report is shown below. The format may change to meet the needs of the project.

- Introduction
- Remedial action description
- Dates and duration of specific activities (approximate)
- Verification that remedial action goals have been met
- Verification of treatment process (if applicable)
- Radiological analysis (if applicable)
- Waste stream disposition
- Site reclamation
- Deviations from the decision document
- Demarcation of waste(s) left in place
- Final disposition of wastes (actual or anticipated)
- Next steps (e.g., interim monitoring, transfer to Environmental Restoration Program)

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5.0 HEALTH AND SAFETY

This section describes the work controls that will be implemented to assure worker H&S during decommissioning. Although not enforceable, the information in this section is intended to provide a general overview of work controls.

As prescribed by DOE Order 440.1, Worker Protection Management for DOE Federal and Contractor Employees (Ref. 25), the Building 776/777 Closure Project must comply with the OSHA construction standards for Hazardous Waste Operations and Emergency Response, 29 CFR 1910, (Ref. 26) and 1926 (Ref. 27). Under these standards, a project-specific H&S Plan (HASP), (Ref. 28), has been prepared to address the safety and health hazards of each phase of operations. The HASP will be used in conjunction with the RFETS HSP Manual (Ref. 30) in planning and performing decommissioning activities. The HASP is not intended to be a stand-alone document, but as guidance to be used during the IWCP process and generation of the activity hazards analysis (AHA).

The DOE Order for Construction Project Safety and Health Management, 5480.9A (Ref. 29), also applies to this project. This order requires the preparation of Job Hazards Analysis (JHA) to identify each task, the hazards associated with each task, and the precautions necessary to mitigate the hazards. Finally, procedures for control of lead, Be, and toxic chemicals contained in the RFETS HSP Manual (Ref. 30) also apply.

To comply with the H&S standards specified, an Integrated Safety Management (ISM) process has been initiated and will be continuously implemented. As shown in Figure 7, the ISM process is structured around five core principles:

1) Define the work scope,
2) Identify and analyze the hazards,
3) Identify and implement controls,
4) Perform the work, and
5) Provide feedback.

The objectives of the ISM and HSP are to:

- Protect employees, co-located workers, the public and environment from hazards during decommissioning.
- Ensure appropriate safety management is administered throughout decommissioning.
- Develop and maintain a high level of H&S awareness that is practiced by all levels of management, supervision, and employees.
- Meet the goal of zero lost time accidents for the entire decommissioning process.
- Foster excellent safety communications between all Site work groups that are affected by the decommissioning of the Building 776/777 Cluster to ensure the intent and goals of RFCA (Ref. 1) are met.
- Train project personnel to ensure they are capable of completing assigned tasks safely and in compliance with applicable environmental and safety regulations.

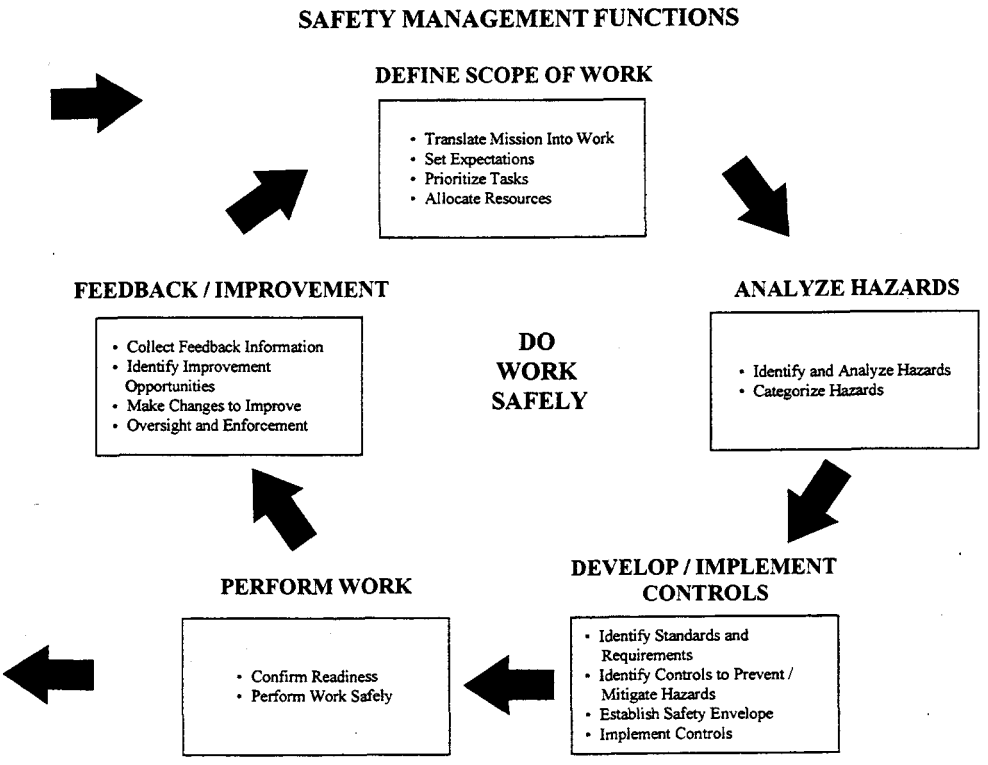

Figure 7. Integrated Safety Management Process

5.1 Integrated Safety Management System

Integrated Safety Management (ISM) is implemented through the Integrated Safety Management System (ISMS) Manual (Ref. 31). The IWCP incorporates ISM principles to prevent and/or mitigate identified work hazards.

Work will be executed following graded readiness demonstrations, which may range from pre-job briefings to Operational Readiness Reviews (ORRs). Safety Systems and Engineering will be consulted to establish the initial activity safety assessment and readiness demonstration scope.

ISM is accomplished by the commitment to the following seven guiding principles:

1) Line management is responsible for safety,
2) Clear roles and responsibilities,
3) Competence commensurate with responsibilities,
4) Balanced priorities,
5) Identification of safety standards and requirements,
6) Hazard controls tailored to the work being performed, and
7) Operations authorized.

Table 9 lists the programs and documents that will be used to apply the ISM process to the Building 776/777 Closure Project.

The work process consists of four major activities: defining the work scope, integrated work control, work planning, and work authorization. The work process is shown in Figure 8 and summarized in the following paragraphs.

5.1.1 Defining the Scope of Work

The work scope is initially identified in the Project Baseline Summary (PBS), then a schedule of activities and the duration are developed along with a basis of estimate (BOE) that establishes the cost and resources required. Once that is completed, an integrated building schedule is developed tying in the PBS and schedule.

5.1.1.1 Project Baseline Summary

The PBS is a formal document that defines a project at RFETS. Items included in the PBS are the authorized scope by FY, budget values for this work scope, milestones associated with work to be accomplished, ISM processes related to implementing the work scope, and the project WBS.

5.1.1.2 Primavera Project Planner

Primavera Project Planner (P3) is the standard scheduling tool used at RFETS. The lifecycle summary baseline schedule for each project (and the Site in totality) is administratively controlled through a formal configuration management system (change control) to ensure that completion dates for milestones and activities are changed only after the proper level of authorization has been obtained.

5.1.1.3 Basis of Estimate

The BOE identifies the resource requirements to complete an activity work scope. Also included in the BOE is the method used to derive the estimate (historical costs, estimator experience or vendor quote), and the quantity of items estimated (such as cubic meters of rubble, volume of liquids treated and number of surveillances). In addition, the calculations used to develop the estimates are included along with the specific basis (such as the method used to determined that three hours of mechanical engineering are required to perform a specific action). The database containing these BOEs (i.e., the Basis of Estimate Software Tool [BEST]) is also under the change control system.

5.1.1.4 Project Execution Plan and Decommissioning Operations Plan

The Project Execution Plan (PEP) is developed to describe the entire project, including landlord, SNM holdup removal, deactivation, decommissioning, and interfaces with other programs. The PEP includes details on project scope, technical approach, risk, methods of accomplishment, environmental requirements, stakeholder interface, organization structure, and financial information.

The Decommissioning Operations Plan (DOP) describes the requirements that must be met to complete decommissioning. The DOP includes a project description, alternatives analysis, project approach, waste management, health and safety, ARARs, environmental consequences, quality assurance, schedules, and organization.

Table 9. Integrated Safety Management System

Five ISM Functions	Seven Guiding Principles						
	Line Management Responsibility	**Clear Roles and Responsibilities**	**Commensurate with Responsibilities**	**Balanced Priorities**	**Identification of Safety Standards and**	**Hazard Controls Tailored to Work Being Performed**	**Operations Authorization**
Define the Scope of Work	IWCP Site Documents Requirements Manual Activity Definition Process Baseline Change Control Process	IWCP Site Documents Requirements Manual Activity Definition Process Baseline Change Control Process	IWCP Site Documents Requirements Manual Activity Definition Process Baseline Change Control Process	Performance Measures Work Activity Definition RFETS CPB/ 10- Year Plan DOP Building 776/777 Priority List Building 776/777 Maintenance Priority Meeting Work Control Procedure	Activity Definition Process Activity Control Envelope JHA IWCP As low as reasonably achievable (ALARA) Review Criticality Safety Evaluation Transportation Safety Manual	Activity Definition Process Activity Control Envelope JHA IWCP ALARA Review Criticality Safety Evaluation Transportation Safety Manual	Authorization Agreement/ Facility Safety Analysis Report (FSAR)/ BIO Conduct of Operations (COOP) (Ref. 32) IWCP WA Procedure
Identify and Analyze the Hazards	IWCP Radiation Protection (RP) Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual Conduct of Engineering Manual (COEM) (Ref. 33)	IWCP RP Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual COEM	IWCP RP Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual COEM	Performance Measures Work Planning Process 776/777 Integrated Schedule	Activity Definition Process Activity Control Envelope JHA IWCP ALARA Review Criticality Safety Evaluation Transportation Safety Manual	Activity Definition Process Activity Control Envelope JHA IWCP ALARA Review Criticality Safety Evaluation Transportation Safety Manual	Authorization Agreement/FSAR /BIO COOP IWCP WA Procedure Pre-evolution Brief Plant Review Committee RWP

Five ISM Functions	Seven Guiding Principles						
	Line Management Responsibility	**Clear Roles and Responsibilities**	**Commensurate with Responsibilities**	**Balanced Priorities**	**Identification of Safety Standards and**	**Hazard Controls Tailored to Work Being Performed**	**Operations Authorization**
Identify and Implement Controls	IWCP Nuclear Criticality Safety Manual HS P Manual COOP Site Documents Requirements Manual Training Users Manual	IWCP Nuclear Criticality Safety Manual HSP Manual COOP Site Documents Requirements Manual Training Users Manual	IWCP Nuclear Criticality Safety Manual HSP Manual COOP Site Documents Requirements Manual Training Users Manual	Performance Measures Work Planning Process 776/777 Integrated Schedule	Craft Knowledge Walkdowns Engineering Standards Operational Safety Requirements/Technical Safety Requirements Dry Runs Procedure Verification and Validation	Activity Definition Process Activity Control Envelope JHA IWCP ALARA Review Criticality Safety Evaluation Transportation Safety Manual	Authorization Agreement/ FSAR/ BIO COOP IWCP WA Procedure Pre-evolution Brief Plant Review Committee RWP Readiness Demonstration
Perform the Work	IWCP RP Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual COOP	IWCP RP Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual COOP	IWCP RP Manual Nuclear Criticality Safety Manual HSP Manual Nuclear Safety Manual COOP	Plan of the Week (POW)/ Plan of the Day (POD)	Pre-evolution Briefing Work Control Process POW/ POD	Pre-evolution Briefing Procedures IWCP Operations Orders Training & Qualification	Shift Manager Process Management Assessment Program
Provide Feedback	Independent Assessment Program Occurrence Reporting Program Quality Assurance (QA) Program Management Assessment Program	Independent Assessment Program Occurrence Reporting Program QA Program Management Assessment Program	Independent Assessment Program Occurrence Reporting Program QA Program Management Assessment Program		Training Lessons Learned Fact Findings		

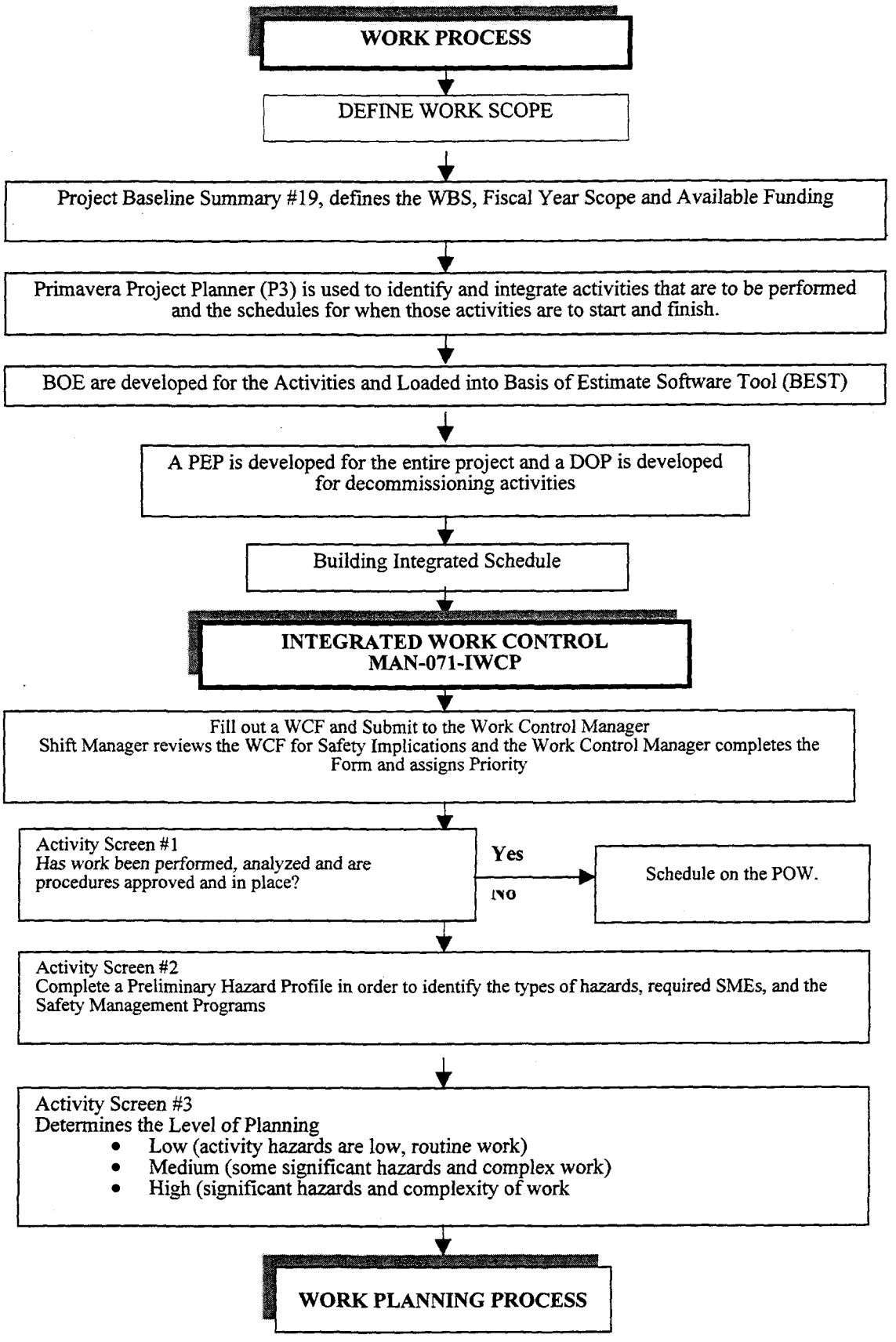

Figure 8. Work Planning Process

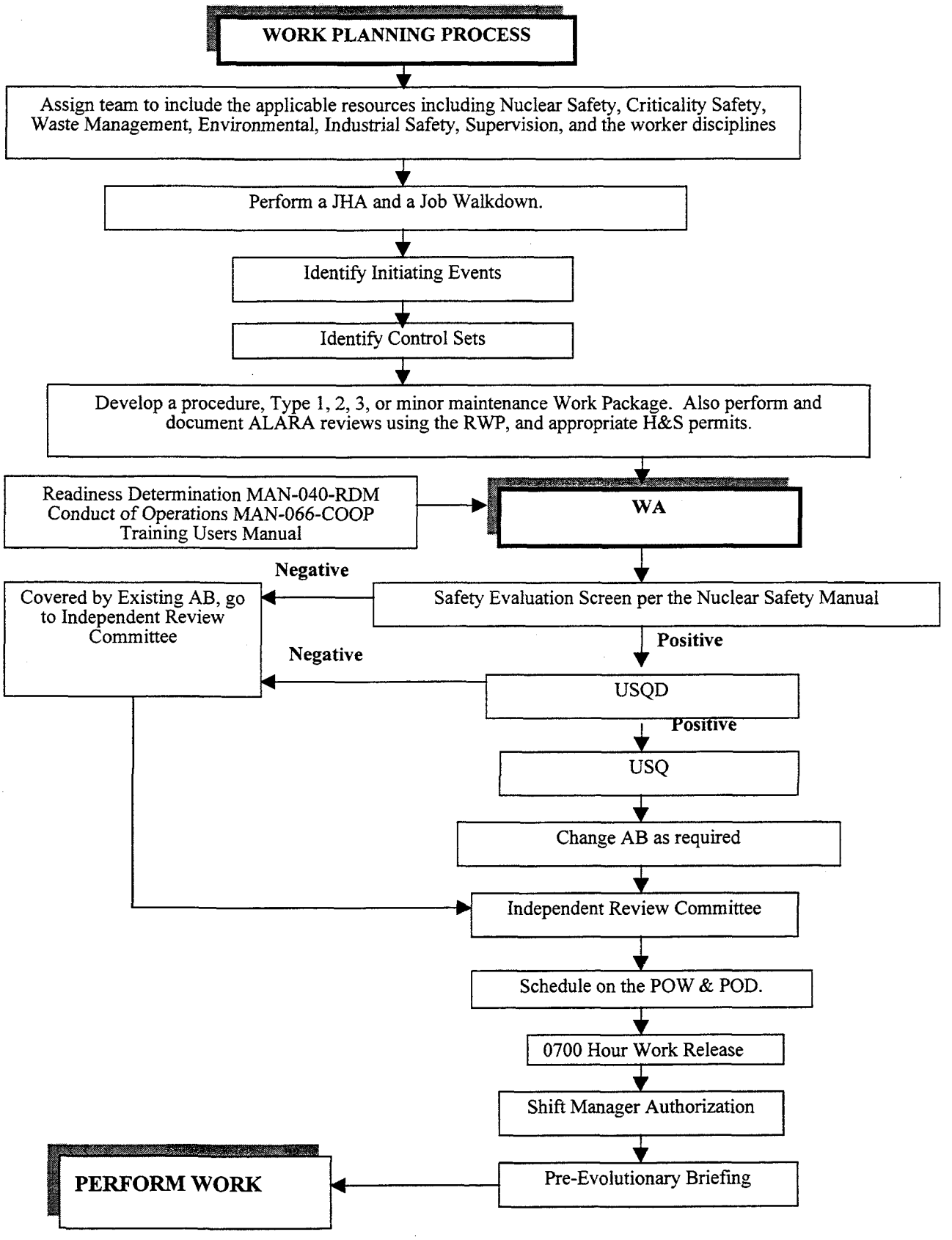

Figure 8. Work Planning Process (cont'd)

5.1.1.5 *Integrated Building Schedule*

The integrated building schedule is a detailed schedule containing the actions that must be taken to meet the scheduled activities and milestones in the P3 lifecycle baseline schedule. This schedule is a current working schedule that is updated weekly (at a minimum) to reflect the completion of activities and to include or delete activities that were omitted or no longer required. The detailed activities in the integrated building schedule roll up to a summary activity in the P3 lifecycle baseline schedule.

5.1.2 Integrated Work Control

The IWCP Manual (Ref. 11) defines the method by which ISM is implemented on the job. It provides a single process through which all work on the Site is performed. It ensures the work is screened consistently against uniform criteria and hazards are appropriately analyzed and controlled.

5.1.2.1 *Work Control Form*

Work is identified and documented on a Work Control Form (WCF). All WCFs are tracked in a site-wide database. The WCF undergoes significant review and prioritization. A determination is made whether the work scope is minor maintenance, preventive maintenance, repair, or an emergency.

5.1.2.2 *Activity Screening*

An activity screening form (ASF) is used for the following activities: (1) new projects, activities, or subcontractor services, and (2) activities for which the hazards, processes, equipment, or controls have changed since the last time they were performed or for which the work control and planning documents require development or revision. The ASF is divided into three main parts: Screen 1, Activity Prescreen; Screen 2, Preliminary Hazards Profile; and Screen 3, Planning Process Screen.

Prior to starting Screen 1, the Activity Prescreen process, the responsible manager collects all available information related to the activity being planned. Once this information is collected, the responsible manger begins the ASF by documenting the project/activity title, description, and specific work location on the first page of the ASF. The responsible manager then completes the prescreen for the activity. The questions answered for Screen 1 on the ASF are used to determine if the activity can be performed using existing work execution documents with no further screens required. If additional screens are required, both Screens 2 and 3 are completed.

Screen 2, the Preliminary Hazards Profile, is used to determine the types of hazards involved with the work activity by answering questions relevant to the number of potential hazards associated with the work activity. The overall number of hazards associated with the work activity are used as data input for scoring and answering Screen 3, the Planning Process Screen. In addition, the recommended safety management plans and relevant SMEs identified in Screen 2 may assist the responsible manager in completing the screens and in implementing the selected level of planning.

Screen 3, the Planning Process Screen, is used to select the required level of planning to be performed. This is graded to the hazards, uncertainty, and complexity of the work activity so that the

appropriate hazards assessment and controls development tools and techniques may be selected. The expectation is that implementation of those controls will result in the work activity being performed safely. After the appropriate level of planning has been selected using the ASF, the responsible manager and SMEs conduct the work planning activity.

5.1.3 Work Planning

The level of work planning required is determined by the results of the ASF. The ASF results are expected to be available for use before planning begins. Three options are available to the responsible manager for planning the work:

- A low planning level approach is used when activity hazards and complexity are low and the work is either routine or simple, and there is some experience at performing most, if not all, of the work.
- A medium planning level approach is used when the activity is somewhat complex, or the activity has not been performed by the project team in the past, and there are some significant hazards associated with the work or some uncertainty about the hazards.
- A high planning level approach is used when there are significant hazards associated with the activity (or significant uncertainty exists about the hazards) and there is significant activity complexity or the activity has not been performed by the project team in the past.

5.1.3.1 Planning Team

The makeup of the planning team depends on the uncertainty of the work activity, the hazards expected to be encountered during the performance of work, and the complexity of the work activity. The ASF provides the responsible manager with a first cut of SMEs who should be considered for membership on the planning team.

The responsible manager generally selects a team of no less than two and typically no more than 12 people. still These people will have a combination of individual and collective experience and education to:

- Provide a detailed analysis of the hazards inherent in the work activity;
- Use the appropriate level of work planning (e.g., low, medium, high) to establish an adequate set of controls for the safe performance of work; and,
- Based on the results of the hazards analyses, determine and express the controls in a way that can be communicated to those performing the work.

The team may be comprised of personnel from the primary and principal subcontractors, including floor-level workers and SMEs, where appropriate. Depending on the rigor required for planning, the team may need to work together to take advantage of the synergism of the team; i.e., the deliberations and decisions about the hazards, the analyses, and the selection of controls take place while the team is together in one location. The LRA may participate in the planning process per section 11.1.3, page 116, of this DOP.

Upon completion of the planning process, the team membership, deliberations, and decisions are documented and included in the Project Record.

5.1.3.2 Job Hazard Analysis

The planning team reviews the results from the Hazards Profile Screen from the ASF as a starting point for identifying all the hazards associated with the activity. The JHA identifies the hazards associated with each first and second level tasks, and document the results. A decision is then made to determine if this information is sufficient. If not, the team conducts an integrated hazards assessment, graded to the activity.

During performing of a hazards analysis, both normal and reasonably anticipated abnormal events are considered. Any pre-existing hazards analyses or safety analyses pertinent to the work under consideration are also considered (e.g., AB, HSP, nuclear safety analysis, auditable safety analysis).

5.1.3.3 Initiating Events

Initiating events and potential mitigating systems failures (i.e., "what-if" scenarios) that could cause a hazard to produce undesirable consequences are identified during the JHA. Some of the scenarios determined by the "what-if" technique may not be included in existing hazards or safety analyses, and may require additional analyses to determine the consequences and required controls (e.g., nuclear safety analyses, criticality safety analyses, chemical safety thresholds). The planning team engages the appropriate qualified personnel to perform these analyses. The team determines the proper controls from their consideration of the analyses and circumstances of performing the tasks.

5.1.3.4 Control Set Identification

The planning team identifies the controls for the hazards associated with each particular task from the hazard analysis. This includes identifying documents that implement the controls for each task. Some examples are procedures, operations orders, RWPs, and H&S plans. If an existing document can not be found, the team recommends a higher level standard or reference that can be used as a basis for implementing the control.

5.1.3.5 Work Control Documents

After identifying the hazard controls, initiating events, and control sets, the project team prepares an IWCP work package or procedure that contains the results from all the steps performed. Procedures are developed generally for long-term, continuous activities in accordance with 1-MAN-001-SDRM, Site Documents Control Manual, (Ref. *34*).

Type 1 IWCP work packages are used for activities that do not require engineering design. These activities are typically repairs, deactivation of equipment, or simple environmental remediation.

Type 2 work packages provide an interim step that simplifies that work that requires design by eliminating the need for developing another until the design phase is complete. This type of work package incorporates the elements of the Type 1 work package into the text.

Type 3 work packages provide the final method used to perform work requiring engineering design. They are phased in from a Type 2 work package after the applicable training and process development has been completed. This format incorporates the elements of the Type 1 and Type 2 work packages.

Minor maintenance, which is defined as minor and routine in nature is an accepted approach to performing maintenance in a more efficient manner without compromising safety. Minor maintenance activities require the ISMS approach, but in a graded and tailored manner.

The responsible manager convenes a team to perform an independent/peer review of the work control document using personnel who were not involved in the document preparation. The cross-table review team prepares a review report and submits it for review and approval by the responsible manager and program chief engineer. The responsible manager resolves and incorporates the cross-table review comments, and indicates his or her approval by signing the work package.

5.1.4 Work Authorization

Work is authorized to ensure activities are properly screened to ensure public, environment, and worker safety.

5.1.4.1 Readiness Determination

Activities are reviewed against a screening process that evaluates the work in terms of complexity, hazards, and scope. Work that is routine (i.e., where the facility has an established track record of successful accomplishment) may be performed without any readiness determination. However, work that is new or complex may require a review by facility or Site management to ensure it can be performed safely. RFFO delegates authority for readiness determinations to facility management or the Site integrating contractor, or retains the authority based on the level of significance of the activity.

5.1.4.2 Conduct of Operations

Conduct of Operations (COOP) is the Site core culture of formality and discipline, where individuals seek and accept ownership of assigned systems and equipment. Formality and discipline provide uniformity and excellence in accomplishing work. COOP is identified in MAN-066-COOP (Ref. 32). The purpose of the manual is to define the RFETS COOP program and to comply with DOE Order 5480.19, COOP Requirements for DOE Facilities.

5.1.4.3 Training

Training is one form of work control that must be considered and requirements determined during the work planning process. Training falls in one of two categories: regulatory required training and job-specific training. Site employees may obtain necessary training in several ways. Resources Management is responsible for ensuring that personnel who engage in any job have the required training prior to the onset of that work. Not only do workers need the required training before commencing work, but also for nuclear facilities, access will be denied to anyone who does not meet area access training requirements. Individual companies are responsible for determining qualifications for staff that plan work using the IWCP. Qualification packages, if needed, are developed and documented in accordance with 96- RF/T&Q-0005, Training and Qualification Program, in the Training Users Manual (Ref. *35*). The Training User's Manual provides guidelines for developing a Training Implementation Matrix, which lists specific training requirements for the work to be performed. Additional details regarding worker training are presented in Section 9.2. Table 10 shows the Training Implementation Matrix for decommissioning work.

5.1.4.4 Safety Evaluation Screen

All work packages and procedures are reviewed against the facility AB to ensure the established control set is adequate to protect the workers and the public. The safety evaluation screen is a checklist used to identify activities that might be outside the AB and therefore might present an Unreviewed Safety Question (USQ).

5.1.4.5 Unreviewed Safety Question

Per DOE Order 5480.21 (Ref. 24), a USQD is performed to evaluate activities with the potential to challenge the limits of the AB. It is a more in-depth review of the activity than the safety evaluation screen. Activities determined to be USQs must be approved by RFFO before work can proceed. If it is determined that additional work and facility safety controls are required to manage the hazards, these are documented in a Justification for Continued Operation (JCO), which must also be approved by RFFO before the work is initiated.

5.1.4.6 Authorization Basis Revision

If a proposed new activity is substantial, the facility's AB may be revised to provide a clear documentation of the activity, related hazards, and necessary safety controls. The AB document will also be revised on an annual basis to incorporate any USQs and JCOs that have been established during the previous year.

5.1.4.7 Independent Safety Review.

An independent safety review is a comprehensive safety review performed by technically competent individual(s) or multidisciplinary independent committees to enhance the safety of nuclear facility operations and activities. The individual(s) or majority of committee members involved in the review shall be independent of the operation or item being reviewed. Requirements for an independent safety review are outlined in 1-52000-ADM-02.01, Rocky Flats Administrative Procedures Manual Operations Review Requirement, (Ref. *36*).

5.1.4.8 Plan of Week

The POW is used to identify work that will be performed during the next week. A regularly scheduled meeting is held weekly to discuss those planned activities.

5.1.4.9 Plan of the Day

The POD is used to schedule, authorize, and control activities in the facility. It is an important forum for resolving conflicts in scheduling work and providing for discussion about planned activities. Each facility plans and schedules work activities with about a three-month horizon, then refines the planning about a week in advance and translates detail into the POD. The POD includes operations, maintenance, surveillances, inspections, and other activities.

Table 10. Training Implementation Matrix for Decommissioning Work

JOB TITLE		MANAGER	MTCE COORD	MTCE PLAN	MAC COORD	ADMIN ASST	MTCE SUPVSR	PIPE FITTER	ELECTRICIAN	PAINTER	D & D WORKER	MACHINIST	PROC SUPVSR	PROC SPEC	UTIL WORKER	CARPENTER	SHEET METAL	COMMENTS
TRAINING																		
Aerial Lift Training							x	x	x	x	x	x				x	x	
Alarms, Sounds, and Responses		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Asbestos Awareness Briefing		x		x			x	x	x	x	x	x	x	x	x	x	x	
Asbestos Worker Initial Training / 32 hrs, #056-354-02							x	*	*	x						x	x	
Asbestos Worker Refresher Training / 8 hrs., #056-351-02							x	*	*	x								
Be Operations							x	x	x	x	x	x	x	x	x	x	x	
BIT-OJT							x						x					
Bldg Tours: 776/777		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Building a Plastic House							x			x	x	x				x	x	
Computer Training: Unclassified		x	x	x	x	x							x					
Confined Space Entry							x	x	x	x	x	x				x	x	
Controller/Evaluator Training		x	x	x			x						x					
Crane and Hoist Inspection											*							
CTR Training and Reference			x															
DOT Awareness							x	x	x	x	x	x	x	x		x	x	
Electrical Safety - CPR qual							x		x		*							
Electrical Safety for Electrical Workers							x		x									
Electrical Safety for Non Elec Workers				x				x		x	x	x	x	x	x	x	x	
Emergency Response Organization (ERO)		x																
Environmental Laws and Regs Workshop		x																
Fall Protection							x	x	x	x	x	x	x	x		x	x	
General Employee Rad Training (GERT)					x	x												
General Emploee Training		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
GERT/Rad Wkr Off Yr Brochure		x	x	x			x	x	x	x	x	x	x	x	x	x	x	
GBs							x	x	x	x	x	x				x	x	
GB Casual User							x	x	x	x	x	x	x	x		x	x	
GB Support Activities							x	x	x	x	x	x	x	x		x	x	
Hazard Communication Work Area Indoctrination		x	x				x	x	x	x	x	x	x	x	x	x	x	
Hazard Communications		x	x				x	x	x	x	x	x	x	x	x	x	x	
Hazardous Materials Awareness for First Responders		x																
Hazardous Waste Operations-24 hr			x															
Hazardous Waste Operations 40 hr		x					x	x	x	x	x	x	x	x	x	x	x	
Hazardous Waste Ops Refresher-8 hr		x	x				x	x	x	x	x	x	x	x	x	x	x	
Hazardous Waste Ops Supervisor		x					x						x					
Hearing Conservation		x	x	x			x	x	x	x	x	x	x	x	x	x	x	
Hoist Apparatus							x	x	x	x	x	x	x	x		x	x	
Incident Command		x																
Industrial Truck Safety Training								x	x		x	x	x	x		x	x	

JOB TITLE		MANAGER	MTCE COORD	MTCE PLAN	MAC COORD	ADMIN ASST	MTCE SUPVSR	PIPE FITTER	ELECTRICIAN	PAINTER	D&D WORKER	MACHINIST	PROC SUPVSR	PROC SPEC	UTIL WRKR	CARPENTER	SHEET METAL	COMMENTS
TRAINING																		
IWCP		x	x	x	x		x						x					
Ladder Safety				x														
Lead Awareness							x	x	x	x	x	x	x	x		x	x	
Lead in the Workplace							x	x	x	x	x	x						
Lockout/Tagout		x		x			x	x	x	x	x	x	x	x		x	x	
Medical/Physical		x	x	x			x	x	x	x	x	x	x	x	x	x	x	
Nuclear Criticality Safety for Fissile Material Handler														x				
Nuclear Criticality Safety OJT			x	x				x	x	x	x	x		x		x	x	
Nuclear Criticality Safety Support			x	x				x	x	x	x	x				x	x	
Nuclear Criticality Safety Supervisor		x					x						x					
Occurrence Reporting Workshop		x																
Painting a Plastic House										x	x							
Personnel Security Assurance Program													x	x				
Pu Facilities Training for Pu Handlers													x	x				
Pressure Safety Awareness		x		x			x	x	x	x	x	x	x	x		x	x	
Rad Con for Managers		x					x						x					
Radiological Glovebag Containment		x					x	x	x	x	x	x				x	x	
Rad Glovebag Containment JPM		x					x	x	x	x	x	x				x	x	
Radiological Worker II		x	x	x			x	x	x	x	x	x	x	x	x	x	x	
RCRA Compliance		x	x	x			x	x	x	x	x	x	x	x	x	x	x	
RCRA Tank Custodian Class		x											x	x				
RCRA Waste Management Class		x											x	x				
Radioactive Source Control Knowledge Exam		x																
Rad Safety Training for Uranium													x	x				
RCRA/Waste Generator Annual Trng Cklst		x					x	x	x	x	x	x	x	x	x	x	x	
RCRA/Waste Gen Annual Trng (Train the Trainer Workshop)							x											
Respiratory Protection: PremAire							x	x	x	x	x	x	x	x		x	x	
Respiratory Protection: Respirator Indoctrination User			x	x				x	x	x	x	x		x		x	x	
Respiratory Protection: Respirator Indoctrination Manager		x					x						x					
Respirator Fit		x	x	x			x	x	x	x	x	x	x	x		x	x	
Rocky FlatsQual Process Brochure		x					x						x					
Scaffolding Safety for Builders/Erectors							x				x					x		
Scaffolding Safety for Competent Persons							x											
TID													x	x				
Waste Generator All Areas Class		x					x	x	x	x	x	x	x	x	x	x	x	
Welding Safety							x	x									x	

5.1.4.10 Work Release

Once the POD has been established and approved by facility management, a meeting is held early in the shift to release work for the day. The Shift Manager chairs this meeting, during which he or she

explains terminations in the facility, identifies radiological areas, and ensures the work to be performed is fully supported.

5.1.4.11 Pre-Evolutionary Briefing and Job Task Briefing

Pre-evolution briefings and job task briefings are performed to ensure that personnel preparing to conduct operations and other work understand what is to be performed, understand the hazards and controls, and have an opportunity to ask questions or raise concerns. The pre-evolution briefing is more formal than the job task briefing. It is a forum for accomplishing ISMS safety functions at the floor level. The pre-evolution briefing provides for feedback as well as for reviewing the scope of work, and reviewing the hazards and the controls to do the work safely. It is also a point in the work process where the required prerequisites are confirmed. A job task briefing is less formal than a pre-evolution briefing. It is conducted by the job foreman and serves as one method by which the ISMS process is implemented on the floor for non-complex, routine, and low hazard work activities. A pre-evolution briefing is documented; a job task briefing is not.

5.2 Criticality Safety

The criticality safety program establishes controls for building activities involving fissionable material. This program includes developing engineered and/or administrative criticality safety controls, monitoring compliance status with established controls that include occurrence investigation and reporting, and maintaining and controlling distribution of technical documents. The program ensures that the criticality safety organization must approve criticality safety controls either through new evaluations or through the Criticality Safety Limit Examination Programs for all activities involving the storage, relocation, and/or processing of fissionable material. The Criticality Safety Program will be implemented in accordance with the DOE's approved RFETS Implementation Plan for the Nuclear Criticality Safety Manual (Ref. 37).

5.3 Radiation Protection

The radiation protection program implements standards, limits, and program requirements for protecting individuals from exposure to radioactive materials. The program is based on the principle of ALARA (i.e., as low as reasonably achievable). Personnel are protected from radioactive materials through radiological surveillance, contamination control, and minimization of exposure. The program provides for personnel dosimetry, surveillance and maintenance of engineered radiation protection systems, the RWP, and area surveillance and posting. Radiological protection for planned activities is ensured through reviews of work control documents, pre-job surveys, and the use of PPE. Personnel exposures are formally tracked, recorded, and reported back to individuals. All radiological monitoring will be performed in accordance with the procedures contained in the RFETS HSP Manual, RFETS Radiological Control Manual, and the Radiological Safety Procedures (RSPs).

5.4 Hazardous Material Protection

Hazardous material protection is accomplished through the H&S Program. This program provides for industrial hygiene and safety (IH&S), which ensures personnel exposures to physical, chemical, and biological hazards in the work environment are controlled. The H&S Program philosophy fosters management accountability and worker involvement. It ensures that supervisors and safety professionals

are required to review work areas and the building in general to identify H&S hazards. Program safety and technical reviews are integrated with work control processes to ensure non-

radiological H&S hazards (i.e., physical, chemical, biological) are identified and appropriate measures are instituted to protect the worker, such as engineered systems, PPE, and monitoring equipment.

Standards for the hazardous material protection program are defined in 29 CFR Part 1910 (Ref. 26), the HSP Manual, and the Potentially Shock Sensitive/Explosive Chemical Characterization, Management, and Disposal Plan.

5.5 Radioactive and Hazardous Waste Management

The waste management, environmental protection, and transportation programs are responsible for radioactive and hazardous waste management at RFETS.

5.5.1 Waste Management and Environmental Protection

The waste management and environmental protection programs provide for managing radioactive and hazardous waste inventories; controlling building effluents; and managing waste generation, storage, treatment, and packaging. These programs, in complying with the standards set by waste management and environmental protection regulations, prevent hazardous and radioactive material spills by ensuring appropriate packaging, inspection, and storage of those materials. These programs aid in the detection of confinement degradation through leak detection practices and routine surveillance and inspection, and assist with appropriate response planning and preparation for events such as hazardous material spills.

5.5.2 Transportation

The transportation program specifies safe and compliant packaging requirements for both onsite and offsite transportation of radioactive and hazardous materials to prevent radioactive and hazardous material release, and to minimize accident consequences. Facility management is ultimately responsible for the safe and compliant packaging of material that is released for transport. The transportation program describes a process for the incorporation of packaging and labeling requirements into work control documents and defines training requirements for personnel involved in packaging and shipment of hazardous materials. Specific to the safe packaging of hazardous materials for shipment, the U.S. Department of Transportation (DOT) regulations define the minimum standards for protecting workers, the public, and the environment from a release of containerized hazardous materials. The Rocky Flats Transportation Safety Manuals (Ref. 38) implement the transportation program.

5.6 Conduct of Operations

The COOP Program (Ref. 32) provides an accurate, disciplined, and formal method for conducting facility operations. It promotes implementation of a set of standards that establish safe operations. Provisions of the program specify that all work is performed by appropriately trained personnel using adequate and controlled procedures, that work is properly supervised, that prior approval of all work is obtained from the Shift Manager or Configuration Control Authority (CCA), and that accountability exists for work performance. The program also provides processes for monitoring facility operations through functions such as log keeping, conduct of rounds, and internal surveillances.

5.7 Fire Protection

The fire protection program provides fire protection engineering, fire hazards analysis, fire prevention requirements (e.g., ignition sources, inspections, training, control of combustibles, transient fire loads, and hot work), and fire response. Fire response plans, training drills, as well as inspection, testing, and maintenance of both engineered fire protection and notification systems ensure personnel safety, fire fighting capability and property loss minimization if a fire should occur. The fire protection program is implemented by the relevant sections of the HSP Manual (Ref. 30).

5.8 Industrial Safety

The industrial safety program contains provisions that implement federal regulations addressing standard industrial hazards. Precedents for controlling standard industrial hazards are well established through institutionalized standards, guidelines, and good practices. In addition, DOE has established its own standards that are identified in DOE Orders. Industrial safety is generally implemented in concert with the hazardous material protection and work control program requirements.

Standards for industrial safety are found in 29 CFR Part 1910 (Ref. 26), portions of 29 CFR 1926 (Ref. 27), and DOE Orders and implemented by the relevant procedures of the HSP Manual (Ref. 30).

5.9 Quality Assurance

The Quality Assurance Program (QAP) assures consistent and appropriate application of quality requirements to the performance of activities using a graded approach. Quality assurance is discussed in Section 10.

5.10 Emergency Preparedness

The emergency preparedness program provides the plans, procedures, and resources necessary to respond to Site emergencies. The program is based on a comprehensive understanding of the hazards and potential radioactive material and hazardous chemical release mechanisms present in the facility.

The program protects facility personnel through management planning, designation of an emergency response organization, and training and drills (site-wide and building-specific) for possible abnormal events including fires, hazardous material spills, inadvertent criticalities, and personnel accountability during facility evacuation. The program provides the necessary trained emergency response personnel to ensure worker and public safety during an abnormal event. Emergency preparedness program elements also include pre-planned actions, prompt and accurate emergency classifications, and timely notifications of the emergency preparedness organization.

The emergency preparedness program is implemented through the RFETS Emergency Plan (Ref. 39), as augmented by the Building 776/777 Emergency Response Operations procedure (Ref. 40).

5.11 Preliminary Hazards Analysis

A Preliminary Hazards Analysis (PHA) has been developed based on the generic activities that are planned decommissioning. The PHA is summarized in Table 11. The PHA documents the hazard identification process for operational activities anticipated to be performed during closure. This PHA will be used with the RLCR to generate detailed AHAs for individual job tasks.

Table 11. Preliminary Hazards Analysis

Major Work Task	Hazard	Cause	Preventive Measures (Evaluated on Case-by-Case Basis)
Perform asbestos and lead abatement and clean up activities	Exposure to asbestos airborne and surface contamination fibers that are lung hazards. Exposure to lead materials is hazardous to internal organs of the body.	Improper clean up techniques including: improper tent decontamination or PPE usage. Improper ventilation usage. Improper waste handling and disposal. Lack of adequate engineering controls. Improper characterization.	Obtain services of certified state abatement inspector to plan and supervise the abatement project Ensure all workers are trained as asbestos workers. Ensure all RFETS asbestos/lead prerequisites are met before job commencing. Develop and implement an AHA(s) for the job. Ensure all medical, training and PPE prerequisites are met. Ensure IH&S personnel perform the proper air monitoring sampling during the course of the job. Ensure all posting and clearance sampling is performed. Ensure that all areas are evaluated and properly characterized by SME or competent person.
Perform Be decontamination and cleanup activities	Exposure to Be contamination is a lung hazard. Improper use of equipment can cause extremity or limb damage to workers.	Improper clean up techniques including: Improper tent, decontamination or PPE usage. Improper ventilation usage. Improper waste handling and disposal Lack of adequate engineering controls	Ensure all workers are trained as Be workers Ensure all RFETS Be prerequisites are met prior to job's commencing. Develop and implement an AHA(s) for the job. Ensure all medical, equipment training and PPE prerequisites are met. Ensure the proper air monitoring sampling is performed during the course of the job by IH&S personnel. Ensure all posting and clearance sampling is performed.
Perform radiological decontamination operations	Exposure to radioactive materials internally and externally. Cell damage and damage to internal body organs may occur with over exposures to radioactive materials. Improper use of scabbling or other decontamination equipment can injure extremities or limbs of workers by causing gash or cutting wounds.	Improper cleanup techniques including: Improper tent, decontamination or PPE usage. Improper ventilation usage. Improper waste disposal and handling. Improper training in the use of decontamination equipment.	Ensure all workers are trained as Rad workers. Ensure all RFETS Rad worker prerequisites are met prior to job commencing. Develop and implement an AHA(s) for the job. Ensure all medical, equipment training and PPE prerequisites are met. Ensure the proper air monitoring sampling is performed during the course of the job by radiological operations personnel. Ensure all posting and clearance sampling is performed.
De-energize work areas and remove cables and wiring	Electrical shock to body, cutting of extremities of body parts using wire strippers or other hand tools, fall off ladder or scaffolding if used.	Lockout/Tagout (LO/TO) not used properly, all workers not informed of LO/TO status. Improper use of hand tools, ladders or scaffolding. Improper lighting in room may result in improper use of equipment Lack of As-Built drawings	Utilize LO/TO procedures properly (including verification that energy source has been isolated). Inspect all hand tools before use. Ensure all workers are trained in ladder, scaffolding and fall protection measures before using this equipment Develop and use task specific AHAs. Perform work area walkdown and conduct proper planning meetings and briefings. Follow all IWCP instructions. Ensure all worker training is current.

Major Work Task	Hazard	Cause	Preventive Measures (Evaluated on Case-by-Case Basis)
Move equipment out of rooms to work areas and transport using forklifts, pallet jacks or pick-up trucks.	Back injuries, pinching, and extremity damage by dropping or falling objects. Internal and external body injuries by vehicle impact. Eye injuries by poking or dust particles in eye hazards. Be exposure from contaminated surfaces under equipment.	Improper lifting techniques, job flow not planned properly, pre-job walkdowns not performed, vehicle alarm systems not working, buddy system not used, lack of attention to detail, worker fatigue, no use or improper use of PPE.	Perform pre-job walkdowns. Develop AHA for job tasks. Use buddy system. Ensure vehicle alarm and braking systems are working properly. Utilize PPE properly. Perform proper lifting techniques. Ensure proper job flow is used and job is not rushed. Do not attempt o move items that are stacked too high. Cover all sharp edges. Perform Be pre-job swipe sampling. Use of material handling equipment.
Cut out piping systems in rooms or work areas	Cutting of body limbs or body parts with mechanical equipment. Piping falling on feet, pinch points of rolling pipe, liquid splashes if piping is not drained. Rebound of pipe can cause body injuries. Radiological/chemical exposures.	Improper use of mechanical equipment including no training on specific equipment being used, piping not rigged or restrained properly, piping not drained prior to cutting. Improper engineering controls.	Proper training with cutting equipment. Develop and utilize AHA for job tasks. Rig and restrain piping properly. Utilize pipe caps after cutting to keep debris from falling out and cover sharp edges of pipes after cutting. Ensure piping has been properly taken out of service. Utilize proper PPE as described in the AHA and RWP.
Hoist, rigging and lifting forklift operation	Bodily injuries due to falling objects or pinching of workers due to space limitations.	No rigging plan, improper rigging techniques, improper worker body positioning.	Develop rigging plan. Comply with all RFETS standards for rigging. Develop AHA and implement. Perform pre-job walkdown and conduct pre-evolution briefing. Walkdown rigging path during all phases. Perform pre and post job inspections on all rigging equipment. Ensure all workers are properly trained. Follow all required steps in the IWCP.
Package waste into containers for storage and shipment. Segregate waste to meet WAC.	Pinching of extremities on container lids, barrels rolling on feet, back strains, foot injuries as vehicle wheels impact or roll onto extremities, cuts/gashes of hands by tooling.	Improper lifting and handling techniques, wrong tooling used to put lids on containers, pallet jack or forklift ramming into workers, job rushed or not planned properly. Package does not meet WAC.	Use of trained and certified waste generator as appropriate. Develop AHA and implement. Review lessons learned from previous waste handling operations. Develop proper tool list before starting job. Ensure all waste containers are properly staged before starting job. Ensure all building notifications are made before moving and handling waste. Follow appropriate RFETS requirements for waste handling and movement. Follow all IWCP requirements.

Major Work Task	Hazard	Cause	Preventive Measures (Evaluated on Case-by-Case Basis)
Cut out and remove GBs in rooms or work areas	Pinch points, foot and hand injuries, cutting of hands/arms, eye and head injuries, burning of skin or extremities. Release of radioactive/chemical contamination and inhalation.	Improper use of grinders or no guards on grinders, cramped working conditions, bad lighting, limited vision, breaking of leaded glass, plasma slag burns through clothing, improper use of PPE Improper use of fixatives. Improper use of respirator Improper engineering controls	Proper training with cutting equipment. Develop and utilize AHA for job tasks. Rig and restrain GBs properly. Use pipe caps on GB piping after cutting. Ensure GBs have been properly taken out of service before work starts. Use proper PPE as described in the AHA. Perform tooling and respirator inspections before each use. Follow all IWCP requirements.
Construct and use scaffolding to perform job tasks	Fall hazards, workers struck by falling objects, hand injuries.	No use of fall protections, improper training, no use of PPE, improper use of tooling, improper rigging and transport of scaffolding pieces, no scaffold inspections, scaffold collapse.	Proper training for scaffold erection and use. Fall protection and rigging training. Proper use of PPE. Develop AHA. Perform and document scaffolding inspections. Ensure all scaffolding is tagged properly. Ensure all toeboards and side rails or compensatory measures are in place.
Perform radiological decontamination operations using scabbling machines, hydrolyzing techniques, hand wiping methods or by applying stripcoat decontamination paint	Injuries to hands and feet by gouging, cutting or impact; inhalation, ingestion or skin exposure to radioactive materials and ammonia vapors; electrocution; falls.	Improper or no training on equipment used for decontamination, improper work are ventilation, improper use of PPE, no job planning. No LO/TO of work area No fall protection	Conduct mock up training on decontamination equipment and stripcoat operations. Develop AHA for job tasks. Ensure work area is properly ventilated before apply stripcoat. Ensure LO/TO operations have been performed. Wear prescribed PPE as determined by IH&S and Radiological Protection. Utilize fall protection, when required. Follow all IWCP, AHA and RWP requirements.
Remove HVAC ductwork	Pinch points, cutting hands, fall from scaffold, release of contamination. Exposure to radiological/chemical contamination.	Improper use of cutting equipment. Non-existent of loose guard rail. Improper use of fixatives. Improper use of respirator. Improper use of ventilation	Proper training in us of tools and PPE. Scaffold inspection before use. Develop AHA for job tasks. Training in use of fixatives. Ensure all toeboards and side rails or compensatory measures are in place.
Perform final cleanup of building/structure	Trips, falls, head wounds, pinch points, punctures, contusions, skin contamination, inhalation of radioactive materials.	Housekeeping, falling objects, non-use of PPE, improper use of PPE, sharp edges or sharp objects not protected, no fall protection, improper ladder use.	Perform weekly housekeeping inspections. Utilize fall protection when applicable. Develop AHA for job task. Utilize PPE property and as described by IH&S and Radiological Protection. Follow all ALARA reviews, AHAs, RWP and IWCP requirements. Obtain confined space permits and training when required.

Major Work Task	Hazard	Cause	Preventive Measures (Evaluated on Case-by-Case Basis)
Perform final survey of building	Falls, head wounds, electric shock, abrasions, cuts, pinches.	No fall protections, improper use of instrumentation, working in tight spaces, tripping hazards, bad housekeeping, improper termination of wiring.	Develop AHA for job task. Perform pre-job walkdowns. Utilize fall protection when required. Complete ladder training as required. Utilize two-person rule when working in elevated locations (above 6 feet). Obtain confined space permits and training when required. Follow all AHA and RWP requirements.

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6.0 WASTE MANAGEMENT

The following paragraphs present an overview of the waste management strategy for the Building 776/777 Cluster.

6.1 RCRA/CERCLA Transition

Hazardous and mixed process waste and liquid waste chemicals will be managed in compliance with the substantive and administrative requirements of RCRA/CHWA (Ref. 6 and Ref. 7) and associated implementing regulations. All other waste will be managed as remediation waste in accordance with the ARARs presented in Section 7.

6.2 Waste Types and Volumes

As discussed in Section 2, beginning in 1958 and continuing through 1969, Building 776/777 housed the Site's Pu foundry, fabrication operations, and parts assembly operations. Subsequent to the fire in 1969, the primary function of the building turned to waste and residue handling, disassembly of retired weapons components, special projects, and support operations, such as laboratories. As a result, a variety of regulated wastes are currently managed and stored in Building 776/777, and additional waste will be generated during decommissioning. Table 12 presents a list of the process waste stored in the building on June 1, 1999. Table 13 provides an estimate of the remediation waste types and volumes that will be generated during decommissioning.

Table 12. Building 776/777 Waste Inventory

Waste Type	Number of Packages
Sanitary	35
Non-Rad/Haz	3
Non-Rad/TSCA	2
LLW	297
LL TSCA	3
LLM	74
TRU	227
TRU TSCA	1
TRM	75
RES	1161
REM	540

Source: WEMS Package Inventory Report, 06/01/99

Table 13. Estimate of Wastes to be Generated During Decommissioning

Category	Sub-Category	Container Type	Volume (m^3)*	Proposed Destination
Radioactive Waste				
TRU/TRM Waste				
	Straight TRU	SWB/55 Gallon Drums	2,264	WIPP
	TRU Mixed (TRM)	SWB/Drums	520	WIPP
	TRU/TRM Liquids	Drums	5	Treatment-WIPP or Approved TSD
LLW/LLM Waste				
	Straight LLW (including asbestos)	Crates/Drums	4,969	Nevada Test Site (NTS), Envirocare
	Structural Rubble	Crates/Drums	3,400	NTS, Envirocare
	Contaminated Recycle Metal	Crates/Drums	1,100	Approved Vendor
	TSCA (PCBs)	Drums	1	Approved TSD
	LLW Liquids	Drums	4	Approved TSD**
	LLM	Crates/Drums	500	Approved TSD**
	LLM Liquids	Drums	6	Approved TSD**
Non-Radioactive Waste				
Hazardous Waste				
	RCRA Solids	Crates/Drums	40	Approved TSD
	RCRA Liquids	Drums	4	Approved TSD
TSCA				
	PCBs	Crates/Drums	1	Approved TSD
Sanitary				
	Routine Sanitary	Crates/Drums	809	Sanitary Landfill
	Special Sanitary (Asbestos, Be)	Crates/Drums	10	Approved TSD

* Waste volume estimates include demolished structures.
** Assumed to include on-Site treatment facilities (e.g., RCRA Unit 374.3).

6.2.1 Hazardous Waste

Most of the hazardous waste at RFETS results from routine operations, such as painting, parts cleaning, and equipment maintenance. Building 776/777 currently has a small inventory of hazardous waste in storage and additional small amounts of hazardous waste will be generated during decommissioning activities, resulting in less than 1% of the overall waste generated from the project. Hazardous waste is routinely shipped to off-site commercial facilities for treatment, recycling, and/or disposal.

6.2.2 Low-Level/Low-Level Mixed (LLW/LLM) Wastes

LLW and LLM wastes were generated in Building 776/777 and other RFETS facilities as a result of nuclear weapons component production processes, and they continue to be generated during routine operations in areas where radioactive materials are managed. LLW and LLM waste forms include combustibles, light metals, and liquids. Building 776/777 is currently used to store both LLW and LLM wastes, which will be repackaged, if necessary, and transferred to a treatment and/or storage

area in preparation for shipment to Envirocare or the Nevada Test Site (NTS). Additional LLW and LLM waste will be generated during decommissioning. Approximately 55% of the waste produced during decommissioning activities will be LLW and about 18% will be LLM waste.

6.2.3 Transuranic/Transuranic Mixed (TRU/TRM) Wastes

Building 776/777 has an existing inventory of TRU and TRM wastes, which will be repackaged, if necessary, and transferred to a treatment and/or storage area in preparation for shipment to WIPP. Additional TRU/TRM wastes will be generated during decommissioning as GBs and B-boxes used in the fabrication, testing, assembly, coating and disassembly of weapon components and the associated Zone I ventilation systems are dismantled and stripped out. Approximately 17% of the waste generated during decommissioning is expected to be TRU and TRM waste.

6.2.4 Residues/Mixed Residues (RES/REM)

Building 776/777 has an existing inventory of RES and REM, which will be transferred to other RFETS facilities for treatment and/or repackaging in preparation for shipment to WIPP. Approximately 1,700 containers of RES and REM are currently stored in Building 776/777, and about 200 liters of liquid RES/REM remain as holdup in tanks and ancillary equipment. No new RES or REM will be generated during decommissioning.

REM contained in tanks and ancillary equipment is managed under the terms and conditions of the Mixed Residue Compliance Order on Consent (Ref. 41) and the Mixed Residue Tank Plan. REM tanks are operationally empty. Under the Mixed Residue Tank Plan, the mixed residue liquids remaining in the tanks and ancillary equipment must be removed to the point where the systems are physically empty. The residual liquids from these tanks will be packaged for transfer to permitted storage pending treatment and/or off-site shipment.[2]

6.2.5 Polychlorinated Biphenyls

PCBs may be found in equipment oils, fluorescent light ballasts, dried applied paints, and capacitors. Equipment oils will be managed as "PCB liquids," ballasts and dried paint containing PCBs will be managed as "PCB bulk product waste" and capacitors containing PCBs will be managed as "PCB items" in accordance with 40 CFR 761 (Ref. 42). A small amount of PCB waste is stored in Building 776/777. Very small amounts will be generated during decommissioning (i.e., <1% of decommissioning waste). This waste will be packaged and transferred to a storage area pending shipment to an approved treatment and/or disposal facility.

[2] Information concerning mixed residue tank systems is provided for the convenience of Building 776/777 personnel. Requirements of the Compliance Order are enforceable pursuant to its terms. Building personnel or others having questions about these requirements should consult with contractor or subcontractor legal counsel. A major modification to this order is currently being negotiated. It is assumed that requirements for management of mixed residue tanks specified in the Mixed Residue Tank Plan will be incorporated into this DOP. This could occur in the final, approved DOP or by modification to the approved DOP. Once incorporated into the DOP, the requirements of the Mixed Residue Compliance Order on Consent for tank management will terminate.

6.2.6 Asbestos Material

ACM, in the form of pipe and equipment insulation, mastic, and floor and ceiling tiles, was used extensively in Building 776/777. As discussed in Section 4, ACM will be removed during decommissioning, and packaged and disposed of at an approved solid waste disposal facility. ACM contaminated with low levels of radioactivity will be sent to NTS and ACM contaminated with hazardous waste will be sent to Envirocare. Uncontaminated ACM will be disposed of in an approved sanitary landfill. ACM will constitute approximately 50% of the LLW generated during decommissioning.

6.2.7 Sanitary Waste

Sanitary waste is collected for recycle or disposal at an approved off-site landfill. Approximately 10% of the waste generated from decommissioning activities will be categorized as sanitary waste. This waste category includes Be waste that is not considered hazardous waste (i.e., Be that is not Be powder).

6.2.8 Wastewater

Wastewater generated from decommissioning activities will be transferred to Building 374 for processing (if hazardous), to the Site sewage treatment plant (if non-hazardous), or directly discharged in compliance with the administrative and substantive requirements of the RFETS NPDES Permit (Ref. 43). Wastewater will be managed consistent with provisions of the RFCA Implementation Guidance Document (IGD), (Ref. 44). It is estimated that less than 1% of the waste generated during decommissioning will be categorized as wastewater.

6.2.9 Waste Chemicals

Pursuant to the Waste Chemical Compliance Order on Consent (Ref. 45), the waste chemical roundup was completed for the Building B777/776 Cluster in 1998. To minimize personnel exposure to radioactive contamination, Be, and asbestos, certain waste chemicals were identified as "excluded chemicals" in accordance with ¶22 of the Compliance Order and disposition of these chemicals was deferred to deactivation and/or decommissioning. As shown in Table 14, there are currently 16 areas where "excluded chemicals" are or may be stored.

Excluded chemicals and other chemicals used during decommissioning activities will be managed as follows:

- Areas used to store "excluded chemicals" are posted with signs identifying them as "CONSENT ORDER EXCLUDED AREAs" or they are described in a building Operations Order that includes a requirement to notify a named point of contact prior to entry (Ref. 46).
- Areas used to store "excluded chemicals" are inspected weekly (Ref. 46).
- Safety-related documents allowing entry or work in an area containing "excluded chemicals" take into account the risks associated with the waste chemicals that may be stored in the area (Ref. 46).

- Liquid waste chemicals will be characterized in accordance with 6 CCR 1007-3, Part 262.11, and managed as process waste under RCRA/CHWA.
- Solid waste chemicals will be characterized to determine the appropriate ARARs and managed as remediation waste.
- Waste chemicals will be disposed of at approved disposal facilities.

In accordance with its terms, the Waste Chemical Compliance Order is hereby terminated as to each excluded area identified in Table 14.

Table 14. "Excluded Chemical" Areas in Building 776/777

Bldg.	Location	SET#	Reason for Exclusion	Status
776	Rm. 134W, TA & RDA	66	TA & RDA - High Contamination Areas	Chemicals present
776	Rm. 135, FBI GBs	61	Inoperable Gloveboxes	Unknown if chemicals present
776	Rm 146	60	High Contamination Area	Unknown if chemicals present
776	Rm. 146A	60	High Contamination Area	Unknown if chemicals present
776	Rm. 146C	60	High Contamination Area	Unknown if chemicals present
777	Rm. 125, GB550*160	1	Inoperable Glovebox	Chemicals present
777	Rm. 131, GB207-110	6	Inoperable Glovebox	Chemicals present
777	Rm. 430, GB207*758	24	Inoperable Glovebox	Chemicals present
777	Rm. 430, GB399	21	Inoperable Glovebox	Chemicals present
777	Rm. 430, GB451	22	Inoperable Glovebox	Chemicals present
777	Rm. 432B	27	High Contamination Area	Unknown if chemicals present
777	Rm. 452, GB034	34	Inoperable Glovebox	Chemicals present
777	Rm. 452, GB541	35	Inoperable Glovebox	Chemicals present
777	Rm. 452, Downdraft	35	Out of Service (Red Tag)	Unknown if chemicals present
777	Rm. 445, Hood #28	33	High Contamination Area, Out of Service (Red Tag)	Chemicals present
777	Rm. 445, Hood #29	33	High Contamination Area, Out of Service (Red Tag)	Chemicals present

6.2.10 Idle Equipment

Idle equipment containing hazardous materials is managed under the Idle Equipment Compliance Order on Consent (Ref. 47) and the Idle Equipment Management Plan (Ref. 48). The substantive requirements for the previously identified idle equipment listed in Table 15, and any idle equipment discovered during deactivation and decommissioning, are as follows:

- Fluids will be drained from idle equipment (e.g., oils, cutting fluids).
- Fluids will be characterized in accordance with 6 CCR 1007-3, Part 262.11.

- If the fluid is oil that has been mixed with a hazardous waste, it will be will be managed as hazardous waste under 6 CCR 1007-3, Parts 261 through 268.
- If the fluid is oil that has not been mixed with a hazardous waste, it will be managed as used oil for recycle, subject to the substantive requirements of 6 CCR 1007-3, Part 279. The substantive requirements include container labeling (i.e., USED OIL), container storage, and release response requirements.
- If the fluid is oil containing >50 ppm PCBs, it will be managed as a PCB liquid under 40 CFR 761.
- Drained equipment will be evaluated to determine final disposition as a product (i.e., transfer to Property Utilization & Disposal [PU&D]), scrap metal, or waste.

In accordance with its terms, the Idle Equipment Compliance Order on Consent is hereby terminated as to each piece of idle equipment listed in Table 15.

Table 15. Building 776/777 Idle Equipment with Hazardous Materials Inventory

Room	Idle Equipment Number	SET#	Description	Material	Quantity
2nd Floor	776-0007	48	S-6 Kathbar Unit, EP-6 Economizer Pump Tank (NDT#2758), C-6 Conditioner Pump Tank, Accumulator Tank (NDT#2759), Conditioner Regenerator Tank	Condensate water, lead	Empty
2nd Floor	776-0010	48	Kathbar System, Units A&B	Condensate water, lead	Varies
118G	776-0018	81	FBI Production Unit, Tank (NDT#2476)	Methyl Alchohol	Empty
Outside	776-0045	81	Aboveground Diesel Fuel Tank	Diesel Fuel	Empty
ModLab	777-0003	49	Lapping Center	Beryllium	Empty
131	777-0018	4	Monarch Lathe (GB-605)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0020	4	Machine Lathe (GB-612)	Carbon Tetrachloride	Empty
131	777-0021	5	Machine Lathe (GB-614)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0023	5	Machining Box (GB-616)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0025	5	Harding X-Lathe (GB-620)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0026	5	Storage Box (GB-621)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0027	6	Jig Bore (GB-626)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0028	6	Small Lathe (GB-627)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0029	6	Briquetting Press (GB-630)	Oil, Carbon Tetrachloride & Pu Chips	Empty
131	777-0031	6	Sheffield Sweep Gage & Storage Box (GB-632)	Carbon Tet., Freon TF, Lube Oils, Duct Sealers, Noucure 28 Catalyst or Polygel	Empty
131	777-0033	6	Five-Axis Mill (GB-636)	Oil, Carbon Tetrachloride & Pu	Empty

Room	Idle Equipment Number	SET#	Description	Material	Quantity
131, 430, 134A	777-0035	78	Carbon Tetrachloride Supply System	Carbon Tetrachloride	Empty
131, 415, 430, 437, 452	777-0037	78	TCA Supply System (Ultrasonic Cleaning Process)	TCA	Empty
134A	777-0038	11	Excello Lathe (GB-746)	Oil, Carbon Tetrachloride & Pu	Empty
134A	777-0039	11	Pneumo Lathe (GB-747)	Oil, Carbon Tetrachloride & Pu	Empty
134A	777-0040	11	Excello Lathe (GB-748)	Oil, Carbon Tetrachloride & Pu	Empty
134A	777-0041	11	Pneumo Lathe	Oil, Carbon Tetrachloride & Pu	Empty
134A	777-0042	10	Drill Press (GB-752)	Oil, Carbon Tetrachloride & Pu	Empty
430	777-0045	18	Equipment (GB-368)	TCA	Empty
430	777-0046	18	Freon Tank, Old Density Balance	TCA, Freon	Empty
430	777-0051	21	Ultrasonic Vapor Cleaner (iincluding ancillary piping to first valve) (GB-426)	TCA	Empty
430	777-0054	22	Ultrasonic Vapor Cleaner (including ancillary piping to first valve) (GB-446)	TCA	Empty
430	777-0056	18	Ultrasonic Vapor Cleaner (including ancillary piping to first valve) (GB-465)	TCA	Empty
430	777-0057	24	Zeiss (GB-756)	Nyes Watch Oil, Carbon Tetrachloride	Empty
430	777-0058	24	Sheffield Sweep Gage (GB-758)	Freon TF, Lube Oil, Duct Sealers, Noucure 28 Catalyst or Polygel	Empty
437	777-0065	29	Grit Blasting Unit and Ultrasonic Cleaner (including ancillary piping to first valve) (GB-A2)	TCA, Metals from Blasting	Empty
437	777-0066	29	Ultrasonic Vapor Cleaner (including ancillary piping to first valve) (GB-A3)	TCA	Empty
440	777-0067	27	Ultrasonic Cleaner, TRIC Lines	TCA	Empty
447	777-0083	32	X-OMAT Processor Tank (NDT#2470)	Process Developer Replenisher	Empty
447	777-0084	32	X-OMAT Processor Tank (NDT#2471)	Fixer Replenisher	Empty
452	777-0090	35	Ultrasonic Vapor Cleaner (including ancillary piping to first valve) (GB-524)	TCA	Empty

6.3 Wastes Requiring Further Processing Prior to Off-Site Disposal

Most of the remediation waste generated during decommissioning will be the same or similar to routine waste for which there is a clear disposal path. However, as described below, certain LLM waste and TRU/TRM waste will require further processing prior to off-site shipment and disposal. At this time, the only treatment processes planned for Buildings 776/777 and/or 730 are debris treatment (Ref. Section 4.5.1.2) and the treatment processes identified in Table 16 (Ref. Section 6.5, below). In the event additional treatment system(s) must be added to treat remediation waste in Building 776/777 or 730, an appropriate decision document, which may include a modification to this DOP, will be prepared prior to construction.

6.3.1 LLM/TRM Wastes Managed Under the Site Treatment Plan

Unless treatment is otherwise specified in Section 6.3, above, the treatment of non-LRD compliant LLM remediation waste will be managed under the Site Treatment Plan (STP). Waste added to the STP will be reflected in inventories reported in the STP Annual Progress Report.

The following non-LDR compliant LLM and TRM remediation waste may be generated during decommissioning:

- Oils, liquids, and solids regulated by both TSCA and RCRA,
- Oils regulated by RCRA,
- Bypass and legacy sludges and wet slurries, and
- Waste chemicals including acids, bases, neutrals, and organic solutions.

As treatment paths and associated timetables are identified for these wastes, they will be included in the subsequent versions of the STP Progress Report.

6.3.2 TRU Sludges and TRU/TRM Oils

Certain TRU sludges in tanks and containers, and TRU/TRM oils will require processing to meet the WIPP WAC. The TRU sludges in tanks and containers include filter sludge (IDC 290), laboratory fluoride sludge (IDC 291), incinerator sludge (IDC 292), miscellaneous inorganic sludge (IDC 299), and sludge from the size reduction vault (IDC 340). These sludges will be dried and packaged for shipment to WIPP.

TRU/TRM oils contaminated with solvents such as carbon tetrachloride and trichloroethylene, were used as coolants in machining operations in Building 776/777 currently have no disposal path.

6.5 Waste Accumulation, Staging, Storage, and Treatment

Wastes generated during decommissioning will be characterized and packaged in compliance with RFETS waste management procedures (Ref. 49), which implement disposal site WAC and DOT packaging requirements. Remediation waste awaiting off-site shipment will be stored in compliance with the waste management ARARs.

Remediation waste that meets the definition of RCRA hazardous or mixed waste may be accumulated, stored, staged, and/or treated in or around the Building 776/777 Cluster in:

- Permitted storage units (if the waste is remediation waste comingled with process waste);
- Generator accumulation areas with no time restrictions (if the waste is remediation waste); or
- TUs with no time restrictions (if the waste is remediation waste requiring treatment). Table 16 provides a summary of the routine treatment processes that may be conducted in TUs during decommissioning.

Table 16. Routine Treatment Processes to be Conducted in Temporary Units (TUs)*

	Treatment Process				
	Size Reduction	**Filtration of Aqueous Wastes**	**Amalgamation of Radioactive Mercury**	**Crushing of Fluorescent Bulbs**	**Waste Solidification**
Hazardous Waste Type	Various: Equipment, debris, lead, circuit boards, leaded glass	Various: Sludges from process waste equipment, paint chips in water	Radioactive elemental mercury	Fluorescent light bulbs	Various: Paint chips in water
EPA Codes	D005, D006, D007, D008	D005, D006, D008	D009	D009	D006, D008
Acceptance Criteria	Visual verification of waste type	Review of process information and visual verification of waste type	Visual verification of waste type	Visual verification of waste type	Review of process information and visual verification of waste type
Verification that Treatment Completed as Designed	Visual verification that waste fits into designated containers	Visual verification that aqueous solution is sufficiently free of solids to be treated in B374 or B891	Visual verification that no liquid elemental mercury remains	Operator knowledge that bulbs were broken and placed in designated container	Visual verification that the waste form is solid, the cement or encapsulent has cured
Estimated Treatment Capacity	20 cubic meters per day	55 gallons per batch	1 pint per batch	50 bulbs per batch	5 gallons per batch
Methods to Prevent Releases to the Environment	Provide ventilation measures to prevent air releases, provide secondary containment if any liquids are anticipated	Conduct treatment within secondary containment pans	Conduct treatment within containment pans	Break bulbs within sealed plastic bags or within solid containers (e.g., drums with filters)	Conduct treatment within containment pans
Inspection Method and Frequency	Visual inspection on operating days	Visual inspection on operating days	Visual inspection on operating days	Visual inspection on a weekly basis	Visual inspection on operating and curing days
Closure Methodology 1	Review operating history of TU to determine if any spills have occurred and if spills occurred, whether or not they were remediated				
Closure Performance Standard 1	Verify that no stains or residual waste from the treatment process are visible in or on the unit.				
Closure Methodology 2	Remove and package for disposal any residual waste, the treatment unit itself, and associated pans or equipment				
Closure Performance Standard 2	Package treatment unit and waste for disposal per site procedures.				
Closure Methodology 3	Rinse or use an extraction technology to clean the surface of equipment of residual waste staining.				
Closure Performance Standard 3	Rinsate standard or clean debris surface standard as described in Section 4.5 of this DOP.				

* Requirements are identified as if for permit waiver; not all information applies to generator treatment. Refer to Section 7.3 for a discussion of treatment ARARs.

6.6 Waste Disposal

Facilities accepting process and remediation waste must meet the requirements of the CERCLA "off-site rule" (Ref. 50). The primary purpose of the "off-site rule" is to clarify and codify the CERCLA requirement to prevent waste generated from remediation activities conducted under a CERCLA action from contributing to present or future environmental problems at off-site waste management facilities. Only facilities meeting EPA's acceptability criteria may be used for off-site management of remediation waste.

6.7 Waste Minimization and Recycling

Waste minimization and recycling will be integrated into the planning and management of the remediation waste generated during decommissioning. Project management will incorporate waste minimization practices into work procedures. Unnecessary generation of sanitary, hazardous, LL/LLM, TRU/TRM, and TSCA waste will be controlled using work techniques that prevent the contamination of areas and equipment; preventing unnecessary packaging, tools, and equipment from entering radiological contaminated areas; and reusing contaminated tools and equipment when practical.

Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented. Property with radiological contamination or property containing hazardous materials may be reused or recycled onsite, offsite by other DOE facilities, or by publicly or privately owned facilities that have proper authorization for receiving it.

Recycling options that may be considered for decommissioning wastes are listed in Table 17. Materials will be recycled based on availability of appropriate recycle technologies, availability of approved facilities, and cost effectiveness. An estimated 3,900 m^3 of structural rubble (i.e., concrete) will be generated during decommissioning. Concrete that meets the free-release criteria prescribed by the RFETS DDCP will be recycled as fill material to contour the land when decommissioning activities are completed. Concrete not meeting the free-release criteria will be disposed of at an approved disposal facility.

Table 17. Material Recycling Options

Waste Stream	Recycle Option	Comments
"Clean" scrap metal (not radioactively contaminated and not considered hazardous in accordance with RCRA)	Recycled through approved scrap metal vendors or via contract.	Material must meet receiving facility's WAC.
Radioactively contaminated scrap metal	Recycled by means of metal melt process vendors or contract.	Material must not exceed contamination types and levels identified in the receiving facility's WAC.
Mixed scrap material (radioactively contaminated scrap metal mixed with hazardous constituents)	None	Currently trying to locate and approve facilities that can manage this type of waste.
Clean building rubble/debris	Proposed reuse as backfill; not yet an approved option.	Must meet criteria to be established in RFCA Standard Operating Protocol.
Clean wiring and other electrical components.	Recycled through approved commercial facilities.	Material must not exceed contamination types and levels identified in the receiving facility 's WAC.
Clean bulk plastics and glass	Recycled through approved commercial facilities.	Material must not exceed contamination types and levels identified in the receiving facility's WAC.
Used lead acid batteries	Recycled through approved commercial recycling facilities	Material must meet receiving facility's WAC.
Used oil	Recycled through approved commercial fuel blending facilities.	Material must meet receiving facility's WAC.

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7.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

To the maximum extent possible, decommissioning activities must comply with the Applicable or Relevant and Appropriate Requirements (ARARs) under CERCLA. ARARs have been identified for the complete scope of decommissioning activities, including demolition. The ARARs are listed at the end of this section, in Table 18.

Pursuant to ¶16 and ¶17 of RFCA, the procedural requirements to obtain federal, state, or local permits are waived as long as the substantive requirements that would have been imposed by the permit process are identified. Furthermore, the method used to comply with the substantive requirements must be explained. The permits that will be waived for decommissioning activities in the Building 776/777 Cluster are the RCRA Part B permits for storage, treatment, and temporary units (TUs). The methods used to meet the substantive requirements imposed by the permit process are described in Sections 4.5, 6.1 through 6.6, and 7.3 through 7.5.

The following paragraphs describe how the ARARs will be applied to decommissioning activities in the B776/777 Cluster. They are intended to complement other descriptions in the DOP in a manner that satisfies the RFCA permit waiver requirements.

7.1 Air

Closure activities have the potential to generate particulate, radionuclide, fugitive dust, and hazardous air pollutant emissions. Subpart H of 40 CFR 61 contains the requirements for monitoring and reporting activities within DOE facilities that have the potential to emit radionuclides other than radon. Building 776/777 is subject to effluent monitoring of radionuclides due to holdup in ducts and GBs. 5 CCR 1001-3, Regulation No. 1, (Ref. 51) governs opacity and particulate emissions. Regulation No. 1, Section II, addresses opacity and prohibits stack emissions from fuel-fired equipment exceeding 20% opacity. Regulation No. 1, Section III, addresses the control of particulate emissions. Fugitive particulate emissions will be generated from demolition and transportation activities. Control methods for fugitive particulate emissions should be practical, economically reasonable and technologically feasible. During demolition activities, dust minimization techniques, such as water sprays, may be used to minimize suspension of particulates. In addition, demolition operations will not be conducted during periods of high wind. The substantive requirements will be incorporated into a control plan that defines the level of air monitoring and particulate control for the project.

5 CCR 1001-3, Regulation No. 3, (Ref. 52), provides CDPHE with the authority to authority inventory emissions. Regulation No. 3, Part A, describes Air Pollutant Emission Notice (APEN) requirements. If applicable, RFETS will prepare an APEN to facilitate the CDPHE inventory process.

7.2 Solid Waste

Hazardous and mixed process waste and liquid waste chemicals will be managed in compliance with substantive and administrative requirements of RCRA/CHWA (Ref. 6 and Ref. 7) and the associated implementing regulations. All other hazardous and mixed wastes will be managed in accordance with the substantive requirements of RCRA/CHWA, 6 CCR 1007-3, Part 261, Identification and

Listing of Hazardous Waste (Ref. 19), specifically Subparts A through D. Sections 268.3, 268.7, and 268.9 (a-c) of 6 CCR 1007-3 will be used to make an LDR determination for remediation waste. Both the administrative and substantive requirements of 6 CCR 1007-3, Part 268 will apply to off-site shipment and disposal of hazardous waste.

Non-radioactive, non-hazardous wastes will be managed in compliance with the substantive requirements of CDPHE regulations pertaining to solid waste management and disposal (6 CCR 1007-2), (Ref. 53).

If necessary, remediation waste may be treated under the TU substantive requirements established in 6 CCR 1007-3, Part 264.553. Incompatible waste, if encountered, will be segregated within the units. An assessment will be performed to determine the need for secondary containment. Secondary containment will be provided, as appropriate, when liquid waste is stored or treated in tanks or containers. Wastes will be characterized, as appropriate, in accordance with the substantive requirements of 6 CCR 1007-3, Part 261, and 40 CFR 761. When tanks are physically empty, berms providing secondary containment will be removed to facilitate equipment removal.

7.3 Treatment

During decommissioning, treatment may be conducted under two separate scenarios:

1) Routine Treatment
   - Generator treatment conducted in accordance with 6 CCR 1007-3, Part 268, will be the most common type of treatment during decommissioning.
   - Treatment in accordance with the substantive requirements of the RCRA Part B Permit (i.e., permit waiver) may be conducted for those wastes that cannot be treated under the generator requirements.
2) Debris Treatment
   - Debris treatment may be conducted where similar types of debris are generated.

7.3.1 Routine Treatment

Routine treatment includes generator treatment and treatment in accordance with the substantive requirements of 6 CCR 1007-3 and the RCRA Part B Permit. Section 6.5 describes how the substantive requirements for generator treatment and treatment under the Part B permit will be applied to routine waste treatment.

7.3.2 Debris Treatment

Debris treatment will be conducted in accordance with steps outlined in Sections 4.5.1.2 and 6.5 of this DOP. Waste resulting from the treatment of debris will be managed in accordance with the waste management ARARs. Waste resulting from the treatment of listed debris will carry the same listing as the listed debris from which it originated. Liquid waste that meets the applicable acceptance criteria will be treated in Building 374 or the sewage treatment plant in compliance with the RCRA and NPDES (Ref. 54) permits.

7.4 Wastewater

Remediation wastewater will be transferred to Building 374 for processing (if hazardous), to the sewage treatment plant (if non-hazardous), or directly discharged in compliance with the administrative and substantive requirements of the RFETS NPDES Permit (Ref. 43). Wastewater will be managed consistent with provisions of the RFCA Implementation Guidance Document (IGD), (Ref. 44).

7.5 Asbestos Containing Material

ACM will be managed in accordance with 5 CCR 1001-10, Regulation 8. Specifically, Section III, C.7.6, provides maximum allowable asbestos levels and sections C.8.2(b), (d) and (f) provide requirements for handling asbestos waste materials.

7.6 Polychlorinated Biphenyls

PCBs will be managed in accordance with 40 CFR Part 761, Disposal of Polychlorinated Biphenyls. Radiologically contaminated PCBs will be managed in conformance with applicable Federal Facilities Compliance Agreement (FFCA) requirements until a final storage facility is approved.

7.7 Migratory Birds

Closure activities may impact migratory birds protected by the Migratory Bird Treaty Act (Ref. 55), and the Fish and Wildlife Conservation Act (Ref. 56). Due to the variations in potential impacts depending upon the season and the nesting schedules for migratory birds, the substantive requirements of these federal statutes, as they apply to federal facilities, will be evaluated prior to conducting the actions associated with decommissioning. The substantive requirements identified during the evaluation will be implemented in accordance with the statues and associated regulations.

Table 18. ARARs for Decommissioning Activities in the Building 776/777 Cluster

REQUIREMENT	CITATION	COMMENT
AIR QUALITY		
Emission Controls for Particulates, Smokes, Carbon Monoxide, and Sulfur Emissions of Volatile Organic Compounds	5 CCR 1001-3 Reg. 1 5 CCR 1001-9 Reg.7	Control of emissions for smoke, particulate, and volatiles of concern. Implemented for construction activities, haul roads, haul trucks, demolition activities
Air Pollution Emission Notice (compliance with National Ambient Air Quality Standards [NAAQS])	5 CCR 1001-3 Reg. 3	Air Pollution Emission Notices are used by the State to help determine State compliance with the NAAQS.
Control of Hazardous Air Pollutants National Emission Standards for Emissions of Radionuclides Other than Radon from DOE Facilities (compliance with NESHAP)	5 CCR 1001-10 Reg. 10 40 CFR 61 Subpart H	Regulated radionuclide emissions from DOE facilities with a limit of ten millirem (mrem) per year. Site Standard.
Ambient Air Quality Standards (compliance with NAAQS)	5 CCR 1001-14	Maintain quality of ambient air for criteria pollutants
Control of Hazardous Air Pollutants (asbestos)	5 CCR 1001-10 Reg. 8	Standards for demolition, storage, and handling of asbestos containing material; emission standards and work place practice requirements; implemented through specific operational directions in IWCPs.
Control of Hazardous Air Pollutants	5 CCR 1001-10 Reg. 8	Implemented if the remedial action involves a specific regulated pollutant (e.g., lead).
Control of Emission Ozone Depleting Compounds	5 CCR 1001-19 Reg. 15	Ensure refrigerants are disposed of properly. Approved vessel recovery method must be used.
WATER QUALITY		
EPA Administered Permit Programs: The National Pollutant Discharge Elimination System (NPDES)	40 CFR Part 122 40 CFR Part 125 5 CCR 1002-8	Requirements for discharge of storm water or treated wastewater into surface water bodies. Criteria and standards for the NPDES. Identify and protect all connections to the sanitary collection system.
SOLID (SANITARY) WASTE		
Solid Waste Disposal Sites and Facilities Definitions Exemptions	6 CCR 1007-2 Section 1.2 Section 1.4.3	"Recyclable materials" means any type of discarded or waste material that is not regulated under Section 25-8-205(1)(e), C.R.S., and can be reused, remanufactured, reclaimed, or recycled. This is the exemption for recyclable material.

REQUIREMENT	CITATION	COMMENT
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)		
Generator Standards	6 CCR 1007-3 Part 262 (40 CFR Part 262)	
Hazardous waste determinations	.11	Persons who generate solid wastes are required to determine if the wastes are hazardous according to 6 CCR 1007-3 Parts 261, 267, 279 [40 CFR Parts 261, 266, and 279]
Hazardous waste accumulation areas	.34 (a)(1)(i),(ii),(iv, excluding A & B); (a)(3); (a)(4); (c)(1)	Persons who accumulate hazardous waste in containers or tanks must manage the waste in a manner that protects human health and the environment.
General Facility Standards	6 CCR 1007-3 Part 264, Subpart B [40 CFR Part 264, Subpart B]	
Waste Analysis	.13 (a)	The owner/operator of a facility that stores, treats, or disposes of waste must verify the waste has been characterized adequately.
Security	.14	The owner/operator of a facility must prevent unauthorized access.
General Inspection Requirements	.15 (a), (c)	The owner/operator of a facility must inspect for malfunctions, deteriorations, and releases, and must remedy any deficiencies noted.
Personnel Training Requirements	.16 (a), (b), (c)	Personnel must be trained to maintain the facility in compliance with the regulations.
General Requirements for Ignitable, Reactive or Incompatible Wastes	.17 (a), (b)	Wastes will be managed to prevent accidental ignition or reaction of ignitable or reactive waste, or the mixing of incompatible waste.
Preparedness and Prevention	6 CCR 1007-3 Part 264, Subpart C [40 CFR 264, Subpart C]	
Design and Operation of a Facility	.31	Design facilities to minimize the potential for fire, explosion or release of hazardous waste.
Required Equipment	.32	Facilities must be equipped with specified equipment to mitigate incidents, should they occur.
Testing and Maintenance of Equipment	.33	Equipment must be maintained.
Access to Communications or Alarm System	.34	Employees must have access to emergency communications when managing hazardous waste.
Required Aisle Space	.35	Aisle space must be maintained to allow unobstructed access to emergency personnel and emergency equipment.
Arrangement with Local Authorities	37	The owner/operator must make arrangements with specified local emergency personnel.

REQUIREMENT	CITATION	COMMENT
Contingency Plan and Emergency Procedures	6 CCR 1007-3 Part 264, Subpart D [40 CFR Part 264, Subpart D]	
Purpose and Implementation	.51 (b)	Emergencies such as fire, explosion, or release of hazardous waste must be mitigated immediately.
Emergency Coordinator	.55	A designated employee is responsible for coordinating emergency response actions.
Emergency Procedures	.56 (a-i)	The Emergency Coordinator must take action in emergency situations
Ground-Water Monitoring	6 CCR 1007-3 Part 264, Subpart F [40 CFR Part 264, Subpart F]	The substantive portions of the groundwater monitoring ARARs for each CERCLA action will be incorporated into the Integrated Monitoring Plan (IMP)
Closure and Post-Closure	6 CCR 1007-3 Part 264, Subpart G [40 CFR Part 264, Subpart G]	
Closure Performance Standards	.111	The owner/operator must close the facility in a manner that protects human health and the environment.
Disposal or Decontamination of Equipment, Structures, or Soils	.114	All hazardous wastes and residues of hazardous waste must be disposed or decontaminated.
Use and Management of Containers	6 CCR 1007-3 Part 264, Subpart I [40 CFR Part 264, Subpart I]	
Condition of Containers	.171	Containers must be maintained in good condition.
Compatibility of Waste in Containers	.172	Wastes must be compatible with containers.
Management of Containers	.173	Containers must be closed except when adding or removing waste.
Inspections	.174	Containers must be inspected weekly.
Containment System Design and Operation Ignitable and Reactive Wastes Incompatible Wastes	 .175 .176 .177	Containment must be designed and operated as specified in these sections.
Closure	.178	Hazardous wastes and residues of hazardous waste must be removed or decontaminated from the unit and soils.
Air Emission Standards	.179	Hazardous wastes must be managed in accordance with AA, BB, CC, as appropriate.

REQUIREMENT	CITATION	COMMENT
Tank Systems	6 CCR 1007-3 Part 264, Subpart J [40 CFR Part 264, Subpart J]	
Design and Installation of New Tank Systems or Components	.192 (a-f)	Tank systems must be designed to maintain their integrity when storing or treating hazardous waste.
Containment and Detection of Releases	.193 (a)(i)(1,2,3,5)	Secondary containment must be designed to contain and detect any releases from the tank system.
General Operating Requirements	.194 (a-c)	Tank systems must be maintained in good condition to prevent releases to the environment.
Inspections	.195 (b,c)	Inspections are conducted to identify any tank system integrity concern.
Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems	.196 (a-c),(e)	Actions must be taken as specified in this section.
Closure and Post-Closure Care	.197 (a,b)	During closure all hazardous waste and hazardous waste residues must be removed from the tank system.
Special Requirements for Ignitable and Reactive Wastes	.198	Ignitable or reactive waste must be managed as specified in this section.
Special Requirements for Incompatible Waste	.199	Incompatible waste must not be introduced into a tank system unless 264.17(b) is complied with.
Air Emission Standards	.200	All hazardous waste shall be managed in accordance with AA, BB, CC
Corrective Action for Solid Waste Management Units	6 CCR 1007-3 Part 264, Subpart S [40 CFR Part 264, Subpart S]	
Temporary Units	.553 (a-c)	Temporary units allow flexibility. Alternative compliance options are included in the waste management section of this CERCLA;/RFCA decision document
Miscellaneous Units	6 CCR 1007-3 Part 264, Subpart X [40 CFR Part 264, Subpart X]	
Environmental Performance Standards	.601	Miscellaneous units must be designed, constructed, operated and maintained in a manner that protects groundwater, surface water, wetlands, soils, and air.
Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action	.602	Miscellaneous units must be managed to ensure compliance with 264.15 (inspections), 264.33 (testing and monitoring), 264.101 (corrective action for releases).
Land Disposal Restrictions	6 CCR 1007-3 Part 268 [40 CFR Part 268]	
Dilution Prohibited as a Substitute for Treatment	.3	LDR determinations must be completed for all hazardous wastes generated.
LDR Determination (Determination if Hazardous Waste Meets the LDR Treatment Standards)	.7	Land disposal restrictions apply primarily to the off-site disposal actions proposed as part of the remedial activity. All of the applicable substantive and administrative regulatory requirements apply to off-site actions.
Special Rules for Wastes that Exhibit a Characteristic	.9 (a-c)	

REQUIREMENT	CITATION	COMMENT
Management of Universal Waste	6 CCR 1007-3 Part 273 [40 CFR Part 273]	Addresses the management of specifically identified batteries, pesticides, and thermostats.
Disposal, Dilution, and Treatment Prohibitions	.31	A large quantity handler of universal waste is prohibited from disposing, diluting, or treating universal waste, except during responses to releases.
Waste Management	.33	Management of universal waste must be conducted in accordance with this section.
Labeling and Marking	.34	Universal waste and the associated accumulation areas must be labeled and marked as defined in this section.
Employee Training	.36	Employees who must be trained on waste management requirements and on emergency procedures according to their responsibilities.
Response to Releases	.37	Universal waste handlers must contain releases of universal wastes, and must manage the resulting waste, as appropriate, in accordance with the hazardous waste regulations.
Standards for the Management of Used Oil	6 CCR 1007-3 Part 279 [40 CFR Part 279]	
Used Oil Specifications	.11	Used oil burned for energy recovery must meet the specifications of this section
Prohibitions	.12	Used oil must not be stored in surface impoundments, be used as a dust suppressant, or be burned in unapproved units according to this section.
Hazardous Waste Mixing	.21	Used oil must be characterized and managed in accordance with 269.10 and this section.
Used Oil Storage	.22	Used oil must be managed in containers or tanks in a manner that protects human health and the environment. Releases must be cleaned up and steps must be taken to prevent re-occurrence.
On-Site Burning in Space Heaters	.23	Used oil may be used as fuel for space heaters if the gases are vented to ambient air, and the maximum capacity of the space heater is not more than 0.5 million Btu per hour.
Performance Standards for Above-Ground Tanks (AST)	7 CCR 1101-14 Part 3	ASTs must be designed, maintained, and operated to prevent releases to the environment.
Normal Venting for Aboveground Tanks	AST.31.5	
Emergency Relief Venting for Fire Exposure for Aboveground Tanks	AST.31.6	
Vent Piping for Aboveground Tanks	AST.31.7	
Tank Openings other than Vents for Aboveground Tanks	AST.31.8	
Standards for Piping, Valves, and Fittings	AST.32	

REQUIREMENT	CITATION	COMMENT
Operating Requirements for Above-Ground Tanks Collision Protection Spill and Overfill Control (excluding reporting requirements), Remote Impounding, Secondary Containment Operation and Maintenance of Corrosion Protection Compatibility Requirements for all Tanks Static Protection for all Tanks Repairs Allowed (excluding requirement for approvals and inspections by State Oil Inspector) Out-of-Service, Closure or Change-in-Service	7 CCR 1101-14 Part 4 AST.40 AST.41 (excluding reporting part of AST.41.1(e)) AST.42 AST.43 AST.44 AST.45 (excluding AST.45(b)(4)) AST.46(c)(1-5)	
Release Detection	7 CCR 1101-14 Part 5 AST.5	
Release Response and Corrective Action Initial Response Initial Abatement Measures Repair or Closure Required	7 CCR 1101-14 Part 7 AST.72(b), (c) AST.73 AST.74	Under Site operating procedures, responses to leaks or spills is immediate, resulting in cessation of the release and an evaluation of the remediation that will be conducted immediately. Surface spills will be cleaned up and actions will be taken to prevent a release to surface water. Releases that impact soils or groundwater will be identified as a PAC, will be added to the ER Ranking List, and will be incorporated into the integrated Site remediation program.
Oil Pollution Prevention Oil Pollution Prevention: Oil Pollution Prevention SPCC Plan Requirements	7 CCR 1101-14 Part 11 AST.112.7(c), (d), (e, 1-2, 4-5)	A SPCC plan is not required as an ARAR; however, the substantive requirements that are incorporated into and implemented as part of the SPCC plan are an ARAR. (e.g., Prediction of the direction, rate and flow of a release from an AST system will be known by the facility and will be available to emergency responders at the facility.)
TOXIC SUBSTANCES CONTROL ACT (TSCA) FOR PCBS		
PCB Use Authorizations	40 CFR 761.30	Lists authorized uses and use restrictions for PCBs
Marking Requirements	40 CFR 761.40 and .45	Labeling of PCBs and PCB storage Areas

REQUIREMENT	CITATION	COMMENT
Disposal Requirements Applicability Disposal Requirements PCB Remediation Waste PCB Bulk Product Waste Disposal of R&D and Chemical Analyses wastes	 40 CFR 761.50 40 CFR 761.60 40 CFR 761.61 40 CFR 761.62 40 CFR 761.64	
Storage Requirements Time limits Facility Criteria Temporary Storage Inspections Container Specifications PCB radioactive waste Marking Laboratory Sample Exemption from Manifesting	40 CFR 761.65	
TSCA Coordinated Approval	40 CFR 761.77	Institutionalizes EPA approval of PCB activities under TSCA when activities are being conducted under another waste management permit, or other decision document issued by EPA or pursuant to a State PCB waste management program
Decontamination Standards and Procedures Self-Implementing Decontamination Measurement-Based Decontamination	40 CFR 761.79	
PCB Spill Cleanup Requirements for PCB Spill Cleanup	40 CFR Subpart G	40 CFR 761 Subpart G is entitled PCB Spill Cleanup Policy and thus many of the sections, specifically for spills after May 4, 1987 are "To Be Considered"
Cleanup Site Characterization Sampling for PCB Remediation Waste	40 CFR Subpart N	Characterization requirements for cleanup of PCB remediation waste
Sampling Non-Porous Surfaces for Measurement-Based Use, Reuse, and On-Site Or Off-Site Disposal Under 761361(a)(6) and Determination Under 761.79(b(3)	40 CFR Subpart P	
Self-Implementing Alternative Extraction and Chemical Analysis Procedures for Non-Liquid PCB Remediation Waste Samples	40 CFR Subpart Q	Applicable procedures when using alternatives to required analytical methodology
Sampling Non-Liquid, Non-Metal PCB Bulk Product Waste for Purposes of Characterization for PCB Disposal in Accordance with 761.62, and Sampling PCB Remediation Waste Destined for Off-Site Disposal, in Accordance with 761.61	40 CFR Subpart R	Characterization requirements for PCB bulk product waste and PCB remediation waste when characterization for disposal is required
Double Wash/Rinse Method for Decontaminating Non-Porous Surfaces	40 CFR Subpart S	Referenced procedure from 761.79
MIGRATORY BIRDS		
Protection of migratory birds through compliance with the Migratory Bird Treaty Act and Wildlife & Fisheries Act	50 CFR 10	Principally focuses on the taking and possession of birds and bird nests protected under this regulation. Enforcement is predicated on location of the project and time of year. Current list of protected birds is maintained by the Ecology Group.

8.0 ENVIRONMENTAL CONSEQUENCES OF ACTION

The following paragraphs summarize the results of the environmental impact analysis, which was performed for the full scope of the Building 776/777 Closure Project. The environmental consequences of the entire project must be considered from the beginning to ensure the cumulative impacts resulting from each stage of the project are acceptable.

8.1 Environmental Impact Issues

As described in earlier sections, Buildings 776/777 and 730 are located entirely within the Protected Area of the Site's Industrial Area (see Figure 3). Initial investigations show that many interior surfaces, process drains, piping, GBs, filters, sumps, and other equipment are radioactively contaminated.

The proposed closure activities for Building 776/777 include asbestos abatement; decontamination of interior surfaces and equipment by vacuuming and wiping; disconnection of electrical power; draining of piping systems and equipment; removal of GBs and other equipment; further decontamination by wiping, washing, scabbling, and other methods; and dismantling and demolition of the buildings. Proposed closure activities for Building 730 include decontamination and removal of equipment. Given the existing environment and industrial setting, environmental impact issues associated with the Building 776/777 Closure Project are relatively limited. The proposed activities should not result in discernible long-term adverse effects to biological resources, including vegetation, wetlands, wildlife habitat, and state and federal sensitive (e.g., threatened and endangered) species populations or habitat. The buildings to be closed are not located in a floodplain and the proposed activities will not affect or be affected by any floodplain. No wild and scenic rivers, prime agricultural soils, parks, or conservation areas will be affected. The proposed activities will provide employment for a limited number of people, most from the current Site work force. Thus, the activities are unlikely to result in adverse socioeconomic effects. The removal of the buildings will not be noticeable off site and will not result in major visual changes.

Therefore, the discussion of impact issues focuses on other areas of potential environmental impacts in addition to potential worker and public impacts. These impacts are as follows:

- Mobilization of radioactive and other contaminants into soil, air, surface water, or ground water;
- The H&S of workers who may be exposed to radioactive, toxic or hazardous materials (including lead, asbestos, and PCBs), and the H&S of the public, resulting from normal closure activities as well as accidents;
- The physical removal of Building 776/777 as an historic structure eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at Rocky Flats; and
- This project's contribution to site-wide cumulative impacts.

8.2 Relative Impacts

As summarized in Table 19 and discussed in this section and in Section 3, the different alternatives have relative impacts on the Site and the surrounding area. Information presented in Table 19 is based on the Cumulative Impact Document (CID) coverage of relative impacts on environmental consequences and DOE policy to the extent practicable. Supporting documentation for this table can be found in Section 3.

8.3 Geology and Soils

Decommissioning activities in the Building 776/777 Closure Project will disturb minor land acreage, most of which has been previously disturbed. There will be a short-term increase in soil erosion and siltation surrounding building drainage pathways. Small, temporary losses of soil productivity may occur from construction activities and vehicle movement. Volatile organic compounds and radionuclide contamination already exist in the Building 776/777 footprint and adjacent areas. Additional contamination of soil from closure activities is not expected because building structures will be decontaminated or contamination will be fixed before the structures are demolished.

8.4 Air Quality

Potential impacts to air quality resulting from the closure of Buildings 776/777 and 730 include:

- Asbestos,
- Be and radionuclide emissions resulting from the decontamination and removal of equipment and building material,
- Hazardous air pollutants from the removal of waste oil collection and organic solvent tanks, and
- Fugitive dust emissions resulting from transportation activities associated with the closure and demolition activities.

Air emissions from these activities will be controlled and monitored in accordance with the Site H&S Program and applicable environmental regulatory requirements.

Asbestos is present in several areas, primarily in the form of pipe insulation. This material will be removed in accordance with applicable state and federal regulations. There is minimal risk of an asbestos release to the air if the removal, transportation, and final disposition is in accordance with applicable regulations.

Decontamination, size reduction, removal, and ultimate disposal of equipment and materials in Buildings 776/777 and 730 have the potential to release radionuclides and residual chemical vapors to the air. Decontamination and size reduction activities take place within containment (either GB, B-box, or hood) equipped with HEPA filters. In addition, the building room exhaust is equipped with HEPA filters.

Table 19. Comparison Summary of NEPA Relative Impacts

Consequences	Decommissioning	No Action With Safe Shutdown	Reuse
1. Human Health *Consequences include radiological and non-radiological safety for workers and public*			
1.1 Radiological for workers and public	Annual exposures are expected to decline once the facility is decontaminated. Specific information is contained in section 8.5.	As the facility continues to age, the potential release of contamination within the building increases over time due to the levels 279 production GBs, connecting stations, and conveyors.	Significant radiological contamination exists from the 1969 fire, 279 production GBs, connecting stations, and conveyors.
1.2 Non radiological for workers and public	Hazards will increase until closure is completed, then fall below any substantial hazard level. Specific information is contained in section 8.6.	Hazards will continue to exist and as the facility ages additional hazards will increase. Be, lead, heavy metals, asbestos, and chemicals exist that would be extremely difficult to stabilize.	Hazards will continue to exist and as the facility ages additional hazards will increase. Be, lead, heavy metals, asbestos, and chemicals exist that would be extremely difficult to stabilize.
2. Worker Safety *Consequences include H&S issues for the worker and the environment*	Hazards will increase until closure is completed, then fall below any substantial hazard level.	Identified hazards will continue to exist. Breaches to equipment from age will cause release of contaminants subjecting the worker to additional hazards.	Identified hazards will continue to exist. Breaches to equipment from age will cause release of contaminants subjecting the worker to additional hazards.
3. Environment *Consequences include environmental, socioeconomic, and cumulative impacts*	These consequences will decrease once remediation is complete. The proposed activities should not result in discernible long term adverse effects to biological resources, including vegetation, wetlands, wildlife habitat, and state and federal sensitive (e.g., threatened and endangered) species populations or habitat. Specific information is outlined in sections 8.1, 8.2, 8.3, 8.7, 8.8, 8.10, 8.11, 8.12, 8.13.	Identified hazards will continue to exist and as the facility ages additional hazards will increase.	Identified hazards will continue to exist. Breaches to equipment from age will cause release of contaminants subjecting the worker and the environment to additional hazards.

Rad-National Emission Standards for Hazardous Air Pollutants (NESHAP) [40 CFR 61, Subpart H, (Ref. 57)] requires that air emissions be monitored from any source having estimated uncontrolled radioactive air emissions that exceed 0.1 mrem/ year effective dose equivalent to any member of the public. Many of the decommissioning activities have a potential for uncontrolled radionuclide air emissions that exceed the 0.1 mrem/year monitoring threshold. As necessary, monitoring will be performed utilizing the existing effluent stack monitors, the existing Radioactive Ambient Air Monitoring Program network, and/ or project-specific air monitoring methods described in the Site Integrated Monitoring Plan. Building ventilation will be modified to utilize existing monitored plenum systems to satisfy monitoring requirements, if necessary.

8.5 Water Quality

The Building 776/777 Closure Project activities are not expected to change storm water runoff, surface water flow characteristics, or ground water. This is because no buildings will be removed below ground level and for reasons discussed below.

Potential impacts to storm water runoff resulting from closure activities include the release of liquids via drains or doors that have direct access to the outdoor environment. It is unlikely this will happen since the IWCP/ISM process discussed in Section 5 will be used. Decommissioning activities that may lead to the release of liquids will be identified to ensure drains and/or doorways are appropriately blocked.

Because portions of ancillary structures off ground level (e.g., cargo containers) will be removed, some new bare ground is expected to be exposed to wind and water erosion, and surface water flow characteristics may be impacted. If appropriate, silt fencing or a similar protective device may be installed to prevent or minimize the possibility of water-borne soil leaving the immediate area and entering drainage ways.

Techniques under consideration for decontamination of the Building 776/777 equipment include the use of water or steam to remove radiological contamination and loose debris. This decontamination technique would be used while the building shell and utility support systems are still intact. While this technique is effective in removing radiological contamination, it may also generate large volumes of potentially contaminated water and may even contribute to the spread of radiological contamination inside the building. Contaminated water will be sampled before release or transfer to Building 374. Ground water should not be affected since no work will be performed outside the facility or below ground level.

8.6 Human Health Impacts

Because the nature of closure work is to remove or fix contamination in place, closure activities have the potential to expose involved workers, non-involved workers, and the public to radiological and other chemical contamination. Disturbance of contaminants or hazardous materials increases the chance of the contaminants or materials to be dislodged, become airborne, and beinhaled by or deposited on humans.

8.7 Radiological Impacts to Workers and the Public

Radiological dose calculations for the public and workers are based on information in the Rocky Flats CID (Ref. 58). The CID radiological dose calculations are based on a 100,000 square foot generic Pu processing facility representative of Pu processing facilities at RFETS. In comparison to the generic facility, Building 776/777 is approximately 224, 600 ft^2. As a result, the dose rates to the workers and public in the CID have been proportionately scaled up to estimate worker and public health impacts for Building 776/777. No other adjustments are needed because the assumptions used for the CID calculations were similar to conditions for Building 776/777 closure (i.e., work crew sizes, activities, and schedules are similar in both cases).

For involved workers, closure activities in Building 776/777 are estimated to result in a total dose of 132 person radiation equivalent man (rem). This exposure is expected to result in less than one (0.05) latent cancer fatalities, assuming the same worker group of 24 people conduct both deactivation and decommissioning activities. This is a conservative estimate since work crews will be assigned so individual workers will be protected in accordance with the Site's 750 mrem per year individual dose administrative control level. Doses to co-located workers from closure operations in Building 776/777 alone have not been evaluated. However, the annual radiological exposure of a maximally exposed co-located (unprotected) worker as a result of site-wide closure activities is estimated at 5.4 mrem (a mrem is 1/1000 of a rem). The corresponding risk of a latent cancer fatality to this worker is two in 1,000,000 (CID, Section 5.8.1 [Ref. 58]).

Annual dose to the maximally exposed off-site individual from Site closure activities is estimated at 0.23 mrem, with a corresponding excess latent cancer fatality of 1 in 10,000,000. The annual dose to the public as a result of all activities in the RFETS Closure Project at the peak time of exposure (1997 - 2006), is expected to be a total of 23 rem for the 2.7 million people projected to be living within 50 miles of the Site in 2006. This annual dose of 23 person-rem is expected to result in less than one (0.01) latent cancer fatality in the entire Denver area population. Estimated annual dose to the maximally exposed off-site individual is well below the applicable standard of 10 mrem/year (CID, Section 5.8.2, [Ref. 58]).

Estimated doses to the maximally exposed offsite individual from the Building 776/777 Closure Project are expected to be a small fraction of the estimates for site-wide activities, as described above. For comparison purposes, the DOE annual limit for occupational exposure as a result of all activities and through all exposure pathways is 5,000 mrem (5 rem) per person. Natural background radiation in the Denver area results in an annual exposure of approximately 350 mrem per person. Exposures to workers and the public will be controlled and monitored in accordance with the RFETS Radiation Safety Program.

8.8 Non-Radiological Health Impacts

Non-radiological health effects from exposure to chemicals are measured by a hazard index. A hazard index greater than one is considered to be a basis for concern, and the greater the index is above one, the greater the level of concern.

For the full suite of Site closure activities, including closure of all buildings, a hazard index of 1.2 has been calculated for a co-located worker who is chronically exposed during working hours to all chemicals of concern simultaneously (as described in the CID, (Ref. 58]) over the entire period

of Site closure. The corresponding cancer risk is five in 100,000 (CID Section 5.8.3, [Ref. 58]). For the full suite of Site closure activities, including closure of all buildings, a hazard index of 1.5 has been calculated for a member of the public who is chronically exposed every day for 70 years to all chemicals of concern (as described in the CID) simultaneously (a highly unlikely event). A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical. Analysis of potentially carcinogenic air pollutants indicates a cancer risk of three in 10,000,000 for the maximally exposed off-site individual (CID Section 5.8.4, [Ref. 58]).

Estimated non-radiological impacts from the Building 776/777 Closure Project are expected to be a fraction of those estimated for site-wide activities, as described above. Exposures to workers and the public will be controlled and monitored in accordance with the RFETS toxic/hazardous materials and chemical safety program.

8.9 Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the Site are exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold. Using a general industry rate for construction to estimate injury and illness cases, Site closure activities are estimated to result in 584 cases of injury and illness during the peak activity period (1997 through 2006), (CID, Section 5.8.3, [Ref.58]). The portion of these cases estimated to result from the Building 776/777 closure alone would be less than the total Site figure.

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the Site. Occupational hazards will be controlled, mitigated, and monitored in accordance with the RFETS occupational health and industrial safety programs.

8.10 Plants and Animals

Because the Building 776/777 Closure Project is located in the previously disturbed Industrial Area, impacts to plants and animals are expected to be minimal. Possible minor impacts to other vegetative areas may result as fugitive dust may distribute undesirable materials among existing plant species. Additional impacts may occur to vegetation due to increased traffic involving closure equipment. Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance.

Some mammals such as rats, mice, rabbits and raccoons are known to be residents of or visitors to the Industrial Area. These mammals will be displaced, and some mortality will occur as a result of closure activities. Bird nests attached to buildings planned for demolition will be destroyed. Due to the proximity Building 776/777 to the segment of Walnut Creek drainage located in the Protected Area, this action may generate dust and sediment runoff that could reach the creek. The activities may therefore require consultation with the U.S. Fish and Wildlife Service for downstream impacts to the Preble's meadow jumping mouse habitat. The Preble's meadow jumping mouse is a federally-listed threatened species under the Endangered Species Act (Ref. 59). Mitigation measures will be determined in consultation with the U.S. Fish and Wildlife Service.

8.11 Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation. In general, waste generated from the Building 776/777 Closure Project will include contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, GBs, and facility structural materials.

Items not radiologicallly contaminated or those decontaminated to a free-release condition may be transferred for use at a different location within RFETS, for use at a different DOE facility, or sent to the PU&D organization for appropriate handling. Items that cannot be decontaminated to a free-release condition will be managed as waste, or reused onsite or at another DOE facility in accordance with applicable release criteria. On-site storage of mixed waste will be in accordance with approved Site procedures until the material can be shipped for off-site disposal. Waste will be characterized, stored, and disposed of in accordance with the requirements of approved Site waste management procedures that meets federal and state regulations.

Waste minimization will be practiced in the planning and management of the Building 776/777 Closure Project waste. Elimination and reduction of waste generated as a result of closure is a high priority. Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented.

8.12 Historic Resources

The impacts related to historical resources are the loss of Building 776/777 as an historic structure eligible for the National Register of Historic Places, and a secondary contributor to a potential Historic District comprised of Cold War Era facilities.

Sixty-four buildings within the Site's Industrial Area, including Building 776/777, have been identified as important to the historic role of the Site in manufacturing nuclear weapons components during the Cold War. Building 776/777 was originally constructed in 1951, with a number of additions between 1962 and 1974. While this building, like the others, is less than 50 years old, it is considered historically significant as an essential component of the weapons production activities at Rocky Flats.

Negotiations have been completed between DOE and the State Historic Preservation Officer (SHPO) concerning the appropriate mitigation measures that apply to these buildings. As a result, Building 776/777 will be subject only to documentation requirements (collection or creation of construction drawings and photographs), rather than preservation. However, the building may not be modified or damaged before completion of documentation, per standards accepted by the SHPO.

8.13 Noise

Closure and demolition of Buildings 776/777 and 730 are not expected to significantly increase noise levels in the Rocky Flats area. Most activities will take place inside the associated buildings so noise levels, if elevated over ambient levels, will be confined to the Building 776/777 Closure Project structures in which they are generated. Other less common activities, such as scabbling, abrasive blasting, and demolition by backhoe, hydraulic cutters, or other devices are expected to

generate noise levels higher than ambient noise levels. Workers involved in these activities will use appropriate hearing protection devices. Outdoor activities will take place at a distance from unprotected workers and the public, and are not expected to increase noise levels to an unsafe level.

8.14 Socioeconomic Effects

Potential impacts from the Building 776/777 Closure Project will contribute to a net overall loss of employment in the long run. The current on-site work force in the building will either be drawn into the closure activities for the building (and potentially for the entire Site) or voluntarily terminate employment. In the short run, closure activities may increase the employment level due to increased needs. Additionally, a modest increase of purchases (raw materials, etc.) may result.

Under the worse case scenario, if the entire work force currently housed in the Building 776/777 Cluster opts to terminate employment, the overall impact will not have a significant adverse effect on the Denver Metropolitan area, including Boulder and Jefferson Counties, where the majority of the work force resides. The net effects of demolishing Buildings 776/777 and 730 are expected to be minimal.

8.15 Cumulative Effects

Impacts associated with the Building 776/777 Closure Project will contribute incrementally to potential site-wide cumulative impacts associated with the overall RFETS Closure Project. Cumulative impacts are impacts to the environment resulting from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions. Significant impacts could result from several smaller actions that, by themselves, may not have significant impacts. The cumulative effects of Site cleanup efforts are described in the CID (Ref. 58). That document describes the short- and long-term effects from the overall Site clean up mission. Cumulative impacts of the Building 776/777 Closure Project relative to the Site closure will include:

- Decommissioning activities associated with the Building 776/777 Closure Project will generate sanitary, hazardous, TSCA, LLW, LLM, TRU, and TRM wastes. Existing on-site interim storage for radioactive waste is limited and eventually, as site-wide closure progresses, additional storage capacity may be needed. The same is true for sanitary waste.
- Increased traffic volume, resulting from off-site shipments of Pu components and waste, may cause congestion problems, an increase in traffic accidents resulting in fatalities, and an increase in potential latent cancer illnesses related to motor vehicle emissions and fugitive dust.
- Adverse socioeconomic impacts from reductions in the Site's workforce will not substantially affect the surrounding region due to additional growth projected in the area.

Some cumulative impacts may ultimately be beneficial to the environment. Remediation is currently scheduled to follow demolition of buildings in the Cluster, which may result in the restoration of some of the Site to its original, natural condition.

- Removing human occupation, structures and paved surfaces and re-establishing native grasses and other vegetation could restore native plant communities and increase wildlife habitat, including threatened and endangered species.
- Cleaning up contamination will reduce health risks to human and animal populations.
- High profile structures that have dominated the Site and the local skyline for 45 years will be eliminated. The landscape will take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area before buildings on the Site were constructed.

8.16 Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity. For the decontamination and closure of the Building 776/777 Cluster, mitigation measures will be considered in the areas of human health, worker safety, release of emissions and mobilization of contaminants, and cultural resources.

Closure will be conducted in accordance with applicable worker and public H&S programs; activities will be managed so that emissions and discharges are within applicable regulatory limits. Closure will take place within containment of existing buildings or temporarily constructed facilities (e.g., tents) with functioning drainage, air filtration, and other safety and environmental protection systems commensurate with risks inherent in the activities being conducted.

Precautions will be taken to ensure compliance with the Migratory Bird Treaty Act (Ref. 60), which prohibits destruction of birds or their nests, active or inactive, without a permit. Building demolition or dismantlement activities that would destroy nests will not be conducted during the nesting season, or measures will be taken to avoid affecting nesting birds prior to the nesting season. Activities that may effect nesting birds will be coordinated with Site ecologists. No closure activities will take place in or near the habitat of known threatened or endangered species.

No modification or damage to buildings determined to be eligible for the National Register of Historic Places will occur prior to completion of the documentation requirements in accordance with the standards set forth in the Memorandum of Agreement with the SHPO.

8.17 Unavoidable Adverse Effects

If conducted as proposed, the Building 776/777 Closure Project will have the following unavoidable adverse effects:

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities;
- Short-term increases in air emissions and water discharges;
- Radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small, but increased risk of adverse health effects;

- Possible industrial accidents, resulting in injury and illness; and
- Increased noise levels for the duration of closure activities.

8.18 Short-Term Uses and Long-Term Productivity

Unlike most projects that commit a site to a particular use for a period of time, the effect of closure will be to undo past commitments concerning use of the Site and open up a new and broad range of potential future uses. Closure does not commit the Site to a particular land use; rather, closure of the Building 776/777 Cluster will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses.

8.19 Irreversible and Irretrievable Commitments of Resources

Funds, labor, equipment, fuel, tools, PPE, waste storage drums, and similar items are resources that will be irretrievably committed to the Building 776/777 Closure Project.

9.0 QUALITY ASSURANCE

9.1 Background

The work performed under this DOP shall be accomplished in accordance with regulatory, EPA, and contractual QA requirements. The regulatory requirements are 10 CFR 830.120, Quality Assurance Requirements (the QA rule) (Ref. 61). The EPA requirement is American National Standards Institute (ANSI)/ASQC-E4, (Ref. 62). The contractual requirement is DOE Order 5700.6C, Quality Assurance. The technical requirements are embodied in ten criteria that are virtually the same in 10 CFR 830.120 and DOE Order 5700.6C. The difference between the two documents is scope and enforceability. 10 CFR 830.120 applies to activities that have the potential to cause radiological harm and is enforceable through fines and penalties; DOE Order 5700.6C applies to non-nuclear activities and is a contractual obligation. ANSI/ASQC-E4 differs from the 10 CFR 830.120 and DOE Order 5700.6C in that it has more detailed requirements for data usability and assessment and control of computer hardware and software.

The application of these requirements to a facility that is undergoing project closure is graded and will diminish as the facility moves closer to the final project endpoint. The purpose of this section is to provide strategic principles and guidance on the application of QA requirements to a facility undergoing project closure where the safety significance of activities and the magnitude of risk associated with the facility are decreasing over time.

10 CFR 830.120, DOE Order 5700.6C and ANSI/ASQC-E4 are implemented through the QAP and the QAP Description (Ref. 63). The QAP Description defines the RFETS requirements that are employed to deliver consistent decommissioning services.

9.2 Quality Criteria

What follows is a discussion of each of the 10 criteria of the QA rule (10 CFR 830.120), DOE Order 5700.6C, and applicable elements of ANSI/ASQC-E4. A comment section is included, articulating guiding principles and examples for reducing the formality and intensity of application of quality requirements toward the completion of the Building 776/777 Closure Project.

Quality Criterion	Document/Procedure that Implements/Satisfies the Criterion
1) Quality Programs	K-H QAP Price Anderson Amendments Act Program (1-MAN-022-PAAAPROG) Management Control System (F&A-MCS-001) Preparation of QA Program Plans (1-C40-QAP-02.01) RMRS QAP Policy RMRS QAP Description (RMRS-QAPD-001)

Comments: A written QA program must be established, implemented and maintained to describe the organization, roles, and responsibilities of those managing, performing and assessing the adequacy of work. The QA rule and 5700.6C allow contractors latitude in grading the appropriate quality levels of control based on factors such as the form and magnitude of the (remaining) hazard, the life cycle stage of the facility, and the mission of the facility. As the scope and risk decrease during the closure process, the level of rigor and intensity of quality requirements may be adjusted and implemented via revisions to the applicable QA Program documents and implementing procedures.

2) Personnel Training and Qualification	K-H Training User Manual K-H Training Implementation Manual RMRS Training Manual (RF/RMRS 97-040) Instruction for Tracking/Scheduling Training and Qualifications and Retention of Records for Training (RMRS INSTR.003) Development, Use and Control of List of Qualified Individuals (RMRS INSTR.004) Identifying Training and Qualification Requirements (RMRS INSTR.005) Development and Use of Qualification Documents (RMRS INSTR.006) Development and Use of Training Implementation Plan (RMRS INSTR.007) Design/Development of Training Materials (RMRS INSTR.011) Operating Organization Requirements for Continuing Training Programs (RMRS INSTR.013) RMRS Qualification and Certification of QA Personnel (RMRS-QA-02.01)

Comments: Personnel performing work shall be trained and qualified based on project-specific requirements prior to the initiation of the Building 776/777 Closure Project. The K-H Training Users Manual and Training Users Matrix provide guidelines for contractors to implement training instructions for RFETS facilities. The documents listed above specify requirements for

qualification or certification of personnel performing specialized activities. The referenced programs are used to identify the positions that require formal qualification and certification (and continuing training). Examples of specific training classes identified for decommissioning workers are as follows: nuclear criticality safety and support, hazardous waste operations, waste generator, Be operations, and electrical safety. As job requirements change, the need for retraining to ensure continued job proficiency will be evaluated.

3) Quality Improvement	Site Corrective Action Requirements Manual (1-MAN-012-SCARM) Site Integrated Oversight Manual (1-MAN-013-SIOM) Site Lessons Learned/Generic Implications Requirements Manual (1-S27-ADM-16.18) Stop Work Action (1-V10-ADM-15.02) Occurrence Reporting Process (1-D97-ADM-16.01) Performance Indication and Trend Analysis (1-E93-ADM-16.18) Control of Non-conforming Items (1-A65-ADM-15.01) Control of Waste Non-conformances (2-U76-WC-4030) RMRS Corrective Action (RMRS-QA-.03.01) RMRS Conduct of Surveillance (RMRS-QA-10.02)

Comments: The processes used to detect and prevent problems and to ensure quality improvement are referenced here. As decommissioning activities are initiated, a graded approach will be used to determine the significance of issues and to determine which corrective actions will be managed in the Plant Action Tracking System. As systems, including VSS, components, and structures are declared out-of-service, the use of the Non-conformance Report process will be greatly reduced.

4) Documents and Records	Site Documents Requirements Manuals RMRS Document Control Program (RMRS RM-06.01) Correspondence Control Program (1-L43-IMS-001) Records management Guidance for Records (1-V41-RM-001) RMRS Records Identification, Generation and Transmittal (RMRS RM-06.02) RMRS Records Receipt, Processing, Retrieval and Disposition (RMRS RM-06.03) Administrative Record Document Identification and Transmittal (RMRS RM-06.04)

Comments: Documents that are used to describe how decommissioning activities are to be accomplished, documents that produce quality affecting data, and documents that support a RFCA (Ref 2) decision or deliverable will be Controlled Documents. A diminishing level of control will be implemented for documentation as the 776/777 Closure Project progresses. A records management program has been established to ensure that records are specified, prepared, reviewed, approved, authenticated, legible, transferred, collected, maintained, stored, retained, and indexed for accountability and retrievability (see Appendix D for list of generic Administrative Record, project and QA records).

5) Work Processes	Configuration Change Control Program IWCP Manual COOP Manual (Man-066-COOP) Site Documents Requirements Manual (1-MAN-013-SDRM) ISM Manual (1-MAN-016-ISM) Radiological Control Manual Radiological Safety Practices Manual HSP Manual Radiation Protection Program Procedure (1-Q50-RPP-0001) Preparation and Control of RMRS Documents (RMRS-QA-05.01) QA Review of RMRS Documents (RMRS - QA-05.02) RMRS QAP Description (App. 3)

Comments: Closure activities are performed according to approved planning and technical documents and according to the prescribed sequence defined during planning when appropriate and stated. The number of procedures/instructions for activities associated with the Building 776/777 Closure Project will be commensurate with the level of activity, complexity, risk and lifecycle stage of the closure. Additional references are included in this section for the use of computer hardware and software and assessment of data usability as prescribed in ANSI/ASQC-E4.

6) Design	Configuration Change Control Program Manual COEM (Design Process Requirements-COEM-DES-210) Computer Software Management Manual (1-MAN-004-CSMM) Operation Review Committee Requirements (1-52000-ADM-02.01) RMRS USQD Process (1-C11-NSM-04.05)

Comments: Sufficient engineering design control must be maintained to ensure that personnel can safely enter and work in the facility and that safety-significant systems, components, and structures (including engineered safety features) will function as intended. The general level of engineering verification and validation associated with engineering activities will be significantly reduced as the Project comes to closure. Peer reviews and one-over-one management reviews will be the norm.

7) Procurement	Procurement System Manual Acquisition Procedure for Requisitioning Commodities and Services (1-W36-APR-111) COEM (Engineering Standards for Procurement –COEM-DES-273) RMRS QA review of RMRS Documents (RMRS -QA-05.02) RMRS Evaluation of Suppliers (RMRS-QA-07.01)

Comments: The procurement of items and services for the Building 776/777 Closure Project will be planned and controlled to ensure that the quality of items and services is known, documented and meets the technical requirements and acceptance criteria of the Project. Towards the end of the Building 776/777 Closure Project, most procurements should be commercial buys that will not require suppliers to have special quality programs, meet acceptance criteria, or to provide documentation beyond that which comes with the item as a matter of course.

8) Inspection and Acceptance Testing	Inspection and Acceptance Test Process (1-PRO-072-001) COEM (Design Process Requirements – COEM-DES-210) Control of Measuring and Test Equipment (1-I97-ADM-12.01) Computer Software Management Manual (1-MAN-004-CSMM) Waste Inspection Procedures Manual RMRS QAP Manual RMRS QAP Description (App. 3)

Comments: Instruments used to demonstrate compliance with the facility's AB, (e.g., LCO surveillances), instruments necessary to operate safety systems, and instruments necessary to demonstrate acceptance criteria for closure activities will be calibrated in conformance with established schedules and acceptance criteria. The level of acceptance testing will be reduced as the level of engineering verification and validation associated with engineering activities diminishes. Waste inspection activities will be based on the requirements in the disposal facility WACs. Additional references are included in this section for the use of computer hardware and software and assessment of data usability as prescribed in ANSI/ASQC-E4.

9) Management Assessment	Site Integrated Oversight Manual (1-MAN-013-SIOM) RMRS Management Assessments (RMRS-QA-09.01) RMRS Corrective Action (RMRS-QA-03.01)

Comments: As the Building 776/777 Closure Project progresses, most of the assessments in the facility will be management assessments (versus independent assessments) and the level of assessment activity will be reduced. Management assessments will be performed to establish whether the prevailing management structure, policies, practices, procedures and data are adequate for ensuring that the quality of the results based on the necessary risk and performance indicators are obtained. Management assessment programs have been established for the following areas: management systems, QA, configuration management, training and qualification, EP, COOP, maintenance, RP, fire protection, waste management/environmental protection, nuclear safety, criticality safety, hazardous material protection, industrial safety, work control, procedures and occurrence reporting. The last large-scale assessment activity should be a Final Status Survey review, and final Project closeout documentation to confirm that the required closure steps have been completed.

10) Independent Assessment	Site Integrated Oversight Manual (1-MAN-013-SIOM) Independent Assessment Program Planning and Scheduling Independent Assessments Readiness Determination Manual (1-MAN-040-RDM) Conduct of Independent Assessment Activities RMRS Qualification and Certification of QA Personnel RMRS Conduct of Surveillances (RMRS-QA-10.02) RMRS Corrective Action (RMRS-QA-.3.01)

Comments: As the Building 776/777 Closure Project approaches completion, the level and intensity of independent assessments will diminish. Assessments will include evaluations to determine and verify whether technical requirements, not just procedural compliance are being implemented. At some point near closure no further independent assessments will be scheduled or performed; limited- scope facility-specific surveillances performed by QA representatives assigned to the facility will continue until shortly before final closure.

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10.0 IMPLEMENTATION SCHEDULE

PBS #19 contains a P3 schedule and BOE for completion of the Building 776/777 Closure Project. The current schedule is provided in Appendix E. The first SETs removed will be the building systems tied into Zone I ventilation (i.e., process tanks, GBs, and B-boxes). The Zone I ventilation is scheduled to be removed in FY04. Remaining room decommissioning activities will take place in FY04. The remaining building utilities, ventilation, and fire systems will be removed during FY05. The building shell will be removed in FY06.

As provided in the DPP, this schedule information is being supplied to add clarity to the DOP and to identify the general planned schedule if full funding is available. The schedule is not an enforceable part of the DOP and DOE or its subcontractors may alter the schedule without penalty and without prior notification or approval of the LRA (Ref. 64).

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11.0 PROJECT ORGANIZATION

This section describes the Building 776/777 Closure Project organization structure, functions, and interfaces. As provided in the DPP, this information is being supplied to add clarity to the DOP and to identify reporting relationships and responsibilities. The organizational structure is not an enforceable part of the DOP and DOE or its contractors may alter the structure without penalty and without prior notification or approval of the LRA (Ref. 59).

11.1 Roles and Responsibilities

The general responsibilities of both internal and external organizations are described below.

11.1.1 Internal Organizations

The management approach of the Building 776/777 Closure Project provides for easily maintained schedule and cost controls. These controls assist the project manager to ensure that the targeted costs and schedule are met. The real-time controls identify changes as requirements dictate, not when the end of the milestone/project is reached and costs have already exceeded the target. This approach provides a format to meet DOE's philosophy, which puts worker safety first, constructs outcome-oriented projects, provides better management and control of finances, and focuses technology. The general responsibilities for the internal organizations are as follows:

Organization	Responsibilities
DOE	• Enforcement of government regulations; • Communications with Site external organizations regarding the closure program; • Oversight of closure operations; • Communications with contractor concerning external and RFFO inputs, including funding and overall direction; and • Interface with other regulatory agencies, stakeholders, and the public.
Contractor	• Communications with DOE-RFFO and the public regarding closure project status; • Integrated management of the closure project including program and subcontractor funding and guidance; • Approval and transmittal of appropriate documents to DOE-RFFO; and • Performance oversight.
Subcontractors	• Communications with contractor and employees regarding the performance and status of the closure project; • Demonstrating that alternate methods of performing closure activities comply with regulatory requirements; • Performing closure activities; and • Submittal of the closure documentation.

11.1.2 External Organizations

Three independent entities oversee and regulate environmental, health, and safety aspects of DOE activities at RFETS: CDPHE, EPA, and the Defense Nuclear Facilities Safety Board (DNFSB). These entities have executed a Memorandum of Understanding (MOU) with DOE to define their respective roles and responsibilities for oversight of activities conducted in the industrial area (Ref. 60). Individual roles and responsibilities are summarized below.

Organization	Roles and Responsibilities
CDPHE	LRA for oversight and enforcement of RCRA/CHWA requirements for hazardous and mixed wastes; oversight of decommissioning of fixed structures and equipment, including closure of RCRA-regulated units; regulation of RCRA corrective actions and CERCLA response actions.
EPA	LRA for final selection of remedial alternatives under CERCLA.
DNFSB	LRA for storage of source, SNM, and byproduct material and radioactive wastes not subject to NRC licensing or CDPHE/EPA regulation.

In that portion of the Site where each is the LRA, CDPHE and EPA have authority to direct DOE to either stop work or perform particular tasks required under RFCA when conditions present an immediate risk to public health or the environment.

11.1.3 Working Relationships

Internal and external organizations will use the consultative process described in ¶¶s 51 through 61 of RFCA (Ref. 1), and the principles articulated in Appendix 2 of RFCA and Section 1.1.1 of the DPP (Ref. 9) to establish and maintain effective working relationships with each other and with the general public. Under RFCA paragraph 70, CDPHE regulates decommissioning activities under CERCLA. To expedite the decommissioning process, the parties have agreed that CDPHE may exercise authority by participating in the IWCP process. Participation in the IWCP process means the LRA has an opportunity to discuss and ask questions, but does not mean that the LRA approves IWCPs. DOE and the contractor will advise CDPHE of IWCP meetings and roundtable discussions, and will provide relevant information in a timely manner. CDPHE, DOE, and the contractor may use the roundtable meetings as a forum for RFCA consultation. If this process does not address CDPHE's concerns and CDPHE believes that proposed work meets criteria for issuing a stop work order under RFCA, it may issue such an order.

11.2 Team Organization Structure

Program management and control will function under an integrated scope, schedule, and cost control system that identifies responsibilities and interfaces. The project organization, under the direction of a project manager, is an integrated team of qualified individuals for each project. This team will consist of personnel from a number of subcontractors Figure 9 and Figure 10 depict the organizational structure project.

The detailed roles and responsibilities of the positions are included at the end of this section. In brief, there is a clear line of responsibility from the Integrator to the Closure Project Manager, through the Work Release Manager, to the Execution Project Managers, and finally to the Enhanced Worker Teams.

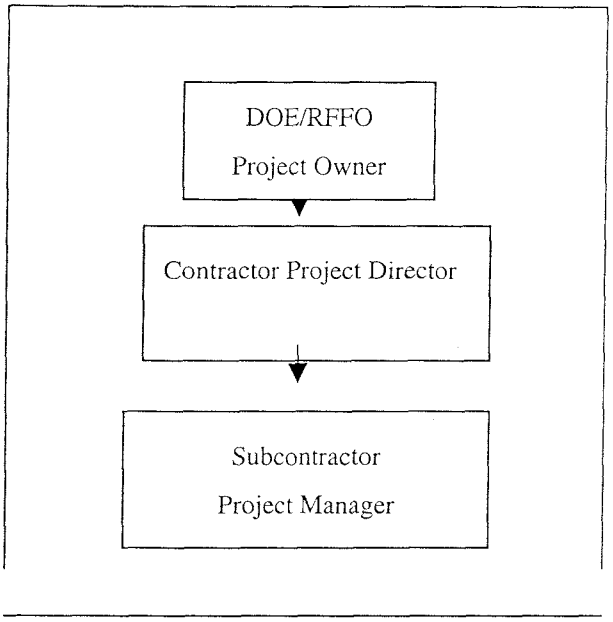

Figure 9. Building 776/777 Closure Project Organizational Chain

- The Project Director is the primary Integrator among all programs and clusters for the Building 776/777 Closure Project. The Director ensures funding is available to accomplish desired tasks and validates schedules.
- The Subcontractor Closure Project Manager is the senior leader of the closure project and has the responsibility to set expectations for performance, establish principles of behavior, and provide the primary senior external interface for the closure project.
- The WA Team Leader is the focal point who maintains the safety and regulatory envelope for the project. This person provides the primary external interface to the site-level safety and regulatory direction and is the link to the COOP improvement. It provides the project constraints to the Project Execution Managers and then gives the day to day authorization to proceed with work similar to the function currently provided by a shift manager.
- The Integration Planning Team Leader is the primary interface to external organizations that are working on the Protected Area Execution Plan and the Ten-Year Plan. Within the closure project, this person has the responsibility to maintain the Project Closure Plan and to coordinate the distributed

planning resources. The plan includes the entire closure project, the three-year plan, as well as the annual, monthly, and weekly plans. The resource needs must be projected to allow adequate time for the Technical Support Manager to acquire the resources for distribution to the Project Team Leaders.

- The Project Team Leaders are an extremely important function - "where the rubber meets the road" on executing the defined project work scope. The work scope definition comes from the Project Integration Manager. For example, a Project Team Leader would be assigned to GB removal or to excess equipment removal.
- The Technical Support Manager is responsible for filling a number of resource needs of the Project Team Leaders as predicted by the Integration Planning Team Leader. These resources include all technical aspects including Nuclear Safety, Criticality Safety, Environmental Safety, Engineering, etc. This person is the focal point for setting resource priorities. The Closure Project Manager sets the absolute Priorities.
- The Decommissioning Operations teams have the self-contained resources to complete the assigned project activity. Some resources will be temporarily assigned to the activity; however, it is the responsibility of the Technical Support Manager to assure that the necessary external resources are provided at precisely the right time. There will be several modes of self-direction depending upon the team experience. This includes self-identification of hazards. Specific resources required are detailed as part of the resource-loaded schedule.

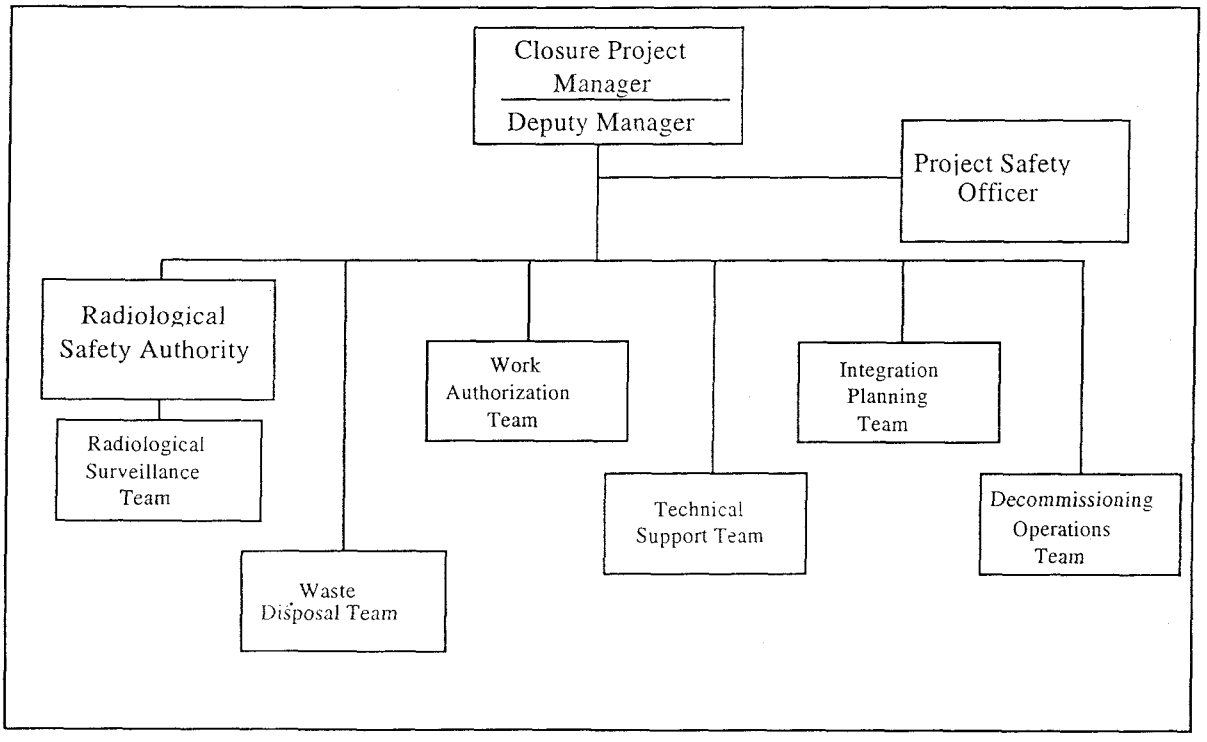

Figure 10. Building 776/777 Closure Project Organization Structure and Functions

11.3 Team Processes

The process used by the project team follow the CH2MHILL Project Delivery System methodology. These processes include:

- Develop the work plan.
- Obtain project endorsement.
- Authorize work performance.
- Implement work.
- Measure and report work performance.
- Control work to the plan.
- Change the plan if necessary.
- Document work performance and results.
- Communicate.
- Close the project.

11.4 Responsibilities

The contractor assigns responsibility to a person for each element of the WBS. The responsibility depends on the level of the WBS. Managers at the lowest level of the WBS have the responsibility to plan and perform the work in the work package, and to report progress. They may authorize changes in the details of the work package that do not affect the CPB or Performance Measures. Changes that meet the Baseline Change Process thresholds must follow the Baseline Change Process as described in Planning and Integration (P&I) Work Instruction INST-002.

11.5 Team Interfaces

Interfaces with other projects include:

- Project No. 02 "Waste Management Project" that affects Building 776/777 consists of WPD #62 "Sanitary Waste Management" and includes management of LLW/LLM waste. WPD #4 "TRU/TRM Storage" includes Venting and Aspirating and management of TRU/TRM waste. WPD #7 "Waste Treatment Project" provides the necessary waste treatment capabilities. Venting and Aspirating drums may be required on an as needed basis. The size reduction airlock may be utilized for characterization and repackaging. Headspace (WIPP) gas sampling, evacuation of TRU and LLW drums, and some glove washing will occur.
- Project No. 06 "SNM Consolidation Project" that affects Building 776/777 consists of WPD #10 "Pu Storage Project and includes the scope of consolidating Pu.

- Project No. 08 "Pu Metals and Oxides Stabilization Project" that affects Building 776/777 consists of WPD #21 "SNM Processing" and includes the scope of ensuring compliance with HSP Manual (Ref. 30).
- Project No. 09 "Pu Liquid Stabilization Project" that affects Building 776/777 consists of WPD #15 "Residue Sampling" and includes characterization and storage of residues.
- Project No. 11 "Uranium Disposition Project" that affects Building 776/777 consists of WPD #17 "Uranium Decontamination" which includes decontaminating parts stored in Building 776/777.
- Project No. 12 "SNM Shipping Project" that affects Building 776/777 consists of WPD #22 "SNM Shipping Project" which includes the scope related to shipping material off site.
- Project No. 23 "Utilities and Infrastructure Project" that affects Building 776/777 consists of WPD #39 "Utilities Projects" which provides utility services. This effort will continue through deactivation and decommissioning. WPD #40 "Infrastructure Project" provides site-wide infrastructure.
- Project No. 24 "Safeguards and Security Project" that affects Building 776/777 consists of WPD #60 "Safeguards and Security Project" which provides safeguards and security support.
- Project No. 27 "Analytical Services Project" that affects Building 776/777 consists of WPD #41 "Analytical Services Project" which provides analytical laboratory support.

Interfaces with other Site organizations include:

- Site Operations and Integration
- Planning and Integration (P&I)
- Safety Systems and Engineering
- Environmental Systems and Stewardship
- Closure Projects

Interfaces outside of the Rocky Flats organizations include:

- CDPHE
- EPA
- Citizens Advisory Board (CAB)
- Defense Nuclear Facilities Safety Board (DNFSB)
- Rocky Flats Coalition of Local Governments (RFCOLG)

Interfaces with DOE include:

- RFFO

12.0 REFERENCE INFORMATION

12.1 Acronyms and Abbreviations

Following is a list of acronyms and abbreviations used in this DOP.

AB	Authorization Basis
ACM	Asbestos containing material
AHA	Activity Hazards Analysis
ALARA	As Low As Reasonably Achievable
APEN	Air Pollutant Emission Notice
ARAR	Applicable or Relevant and Appropriate Requirement
AR	Administrative Record
ASF	Activity screening form
ASRF	Advanced Size Reduction Facility
Be	beryllium
BIO	Basis for Interim Operations
BOE	Basis of Estimate
BEST	Basis of Estimate Software Tool
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CHWA	Colorado Hazardous Waste Act
CID	Cumulative Impact Document
COEM	Conduct of Engineering Manual
CO_2	carbon dioxide
COOP	Conduct of Operations
CPB	Closure Project Baseline
cpm	counts per minute
DDCP	Decontamination & Decommissioning Characterization Protocol
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOP	Decommissioning Operations Plan
DOT	U.S. Department of Transportation
DPP	Decommissioning Program Plan

EP	Emergency Preparedness
EPA	Environmental Protection Agency
FBI	Fluidized Bed Incinerator
FSAR	Facility Safety Analysis Report
FY	Fiscal Year
GB	glovebox
HASP	Health & Safety Plan
H&S	Health & Safety
HEPA	High Efficiency Particulate Air
HSP	Health & Safety Practices
HVAC	Heating ventilation and air conditioning
ICMS	Integrated Chemical Management System
IDC	Item Description Code
IH&S	Industrial Hygiene & Safety
IHSS	Individual Hazardous Substance Site
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWCP	Integrated Work Control Program
JHA	Job Hazard Analysis
LCO	Limiting Condition of Operations
LDR	Land Disposal Restriction
LBP	Lead based paint
LL	Low-level
LLM	Low-level Mixed
LLW	Low-level Waste
LLMW	Low-level Mixed Waste
LO/TO	Lockout/Tagout
LRA	Lead Regulatory Agency
mrem	millirem
NAAQS	National Ambient Air Quality Standards
nCi	nanocurie
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
NTS	Nevada Test Site

OASIS	Organic and Sludge Immobilization System
OSHA	Occupational Safety & Health Administration
OU	Operable Unit
P&I	Planning and Integration
PBD	Project Baseline Description
PBS	Project Baseline Summary
PCBs	Polychlorinated biphenyls
PEP	Project Execution Plan
PHA	Preliminary Hazard Analysis
POD	Plan of the Day
POW	Plan of the Week
PPE	Personal Protective Equipment
ppm	parts per million
Pu	plutonium
QA	Quality Assurance
QAP	Quality Assurance Program
RCRA	Resource Conservation and Recovery Act
rem	Radiation Equivalent Man
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RP	Radiation Protection
RWP	Radiological Work Permit
S&H	Safety & Health
S&M	Surveillance & Maintenance
SHPO	State Historic Preservation Officer
Site	Rocky Flats Environmental Technology Site
SME	Subject Matter Expert
SNM	Special Nuclear Material
SWB	standard waste box
TBC	to be considered
TCLP	Toxicity Characteristic Leaching Procedure
TRM	Transuranic Mixed

TRU	Transuranic
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TU	Temporary Unit
UCNI	Unclassified Controlled Nuclear Information
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
VSS	Vital Safety Systems
WA	Work Authorization
WAC	Waste Acceptance Criteria
WAD	Work Authorization Document
WBS	Work Breakdown Structure
WCF	Work Control Form
WIPP	Waste Isolation Pilot Plant
WPD	Work Proposal Document

12.2 Definitions

Activity. An activity, in terms of the scope hierarchy defined here, is the lowest level of scope the Site maintains in the CPB (P3 schedule, budget/funding baseline). Activities are statused on a monthly basis for reporting of accomplishments against the approved work plan. Any change to the activity scope, schedule or cost (budget or funding) profile is subject to review and approval by the appropriate RFETS Change Control Board prior to proceeding with the proposed change.

Applicable or Relevant and Appropriate Requirements (ARARs). ARARs are promulgated standards, requirements, criteria or limitations that will be met during closure activities to ensure the protection of human health and the environment and to ensure proper management of waste. A requirement under environmental laws may be either "applicable" or "relevant and appropriate".

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Only those standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. (40 CFR 300.5)

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site, their use is well suited to the particular site. Only those standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. (40 CFR 300.5)

Asbestos. Asbestiform varieties of chrysolite, amosite (cummintonite-grunerite), crocidolite, anthophyllite, tremolite, and actinolite.

Asbestos Containing Material. Material containing more than 1% asbestos.

CERCLA. The Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §9601 et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499, and the Community Environmental Response Facilitation Act, Pub. L. No. 102-26; and the National Contingency Plan and other implementing regulations. (RFCA ¶25[m])

Closure. In the context of RCRA/CHWA hazardous waste management units, closure means actions taken by an owner or operator of a treatment, storage, or disposal unit to discontinue operation of the unit in accordance with the performance standards specified in 6 CCR 1007, §264.11 or §265.111, as appropriate. (RFCA ¶25[p])

Co-located Worker. A worker located 100 meters from the Building 776/777 Cluster. This value was chosen due to RFETS compact dimensions.

Deactivation. The process of placing a building, a portion of a building, structure, system, or component (as used in the rest of this paragraph "building") in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program in a manner that is protective of workers, the public, and the environment. Actions during deactivation could include the removal of fuel, draining and/or de-energizing of non-essential systems, removal of stored radioactive and hazardous materials, and related actions. As the bridge between operations and decommissioning, based upon Decommissioning Operations Plans or the Decommissioning Program Plan, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition. Deactivation does not include decontamination necessary for the dismantlement and demolition phase of decommissioning (i.e., removal of contamination remaining in fixed structures and equipment after deactivation). Deactivation does not include removal of contaminated systems, system components, or equipment except for the purpose of accountability of SNM and nuclear safety. It also does not include removal of contamination except as incidental to other deactivation or for the purposes of accountability of SNM and nuclear safety. (RFCA ¶25 [y])

Decommissioning. Decommissioning means, for those buildings, portion of buildings, structures, systems, or components (as used in the rest of this paragraph, "building") in which deactivation occurs, all activities that occur after the deactivation. It includes surveillance, maintenance, decontamination and/or dismantlement for the purpose of retiring the building from service with adequate regard for the health and safety of workers and the public and protection of the environment. For those buildings in which no deactivation occurs, the term includes characterization, surveillance, maintenance, decontamination and/or dismantlement for the purpose of retiring the building from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted use or, if unrestricted use is not feasible, restricted use of the buildings. (RFCA ¶25[z])

Decontamination. The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning or other techniques to achieve a stated objective or end condition. (RFCA ¶25[aa])

Dismantlement. The demolition and removal of any building or structure or a part thereof during decommissioning. (RFCA ¶25[ab])

End-Point Criteria. The defined objective(s) or goal(s) that represent the agreed upon facility condition to be achieved during the closure process.

Enhanced Work Planning. A process that evaluates and improves the program by which work is identified, planned, approved, scheduled, coordinated, controlled, and executed.

Facilities. Buildings and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein; outside plant, including site development features such as landscaping, roads, walks, and parking areas; outside lighting and communication systems; central utility plants; utilities supply and distribution systems; and other physical plant features.

Facility Disposition Process. The sequence of activities required to take a facility from its existing condition to final disposition. The goal of disposition is for the Site to accomplish all of the activities necessary either to demolish the building and dispose of the resulting waste or to release the building for reuse.

As discussed in RFCA Attachment 9, unless building specific conditions otherwise warrant, the following activities are typical, but not all inclusive, of those that will be performed for a building: (a) containerized waste and materials removed; (b) Liquid waste and processing systems drained; (c) RCRA units closed or have a closure plan integrated with building disposition plan; (d) all TRUM, defined as materials in excess of 100 nCi per gram, removed; (e) equipment, piping, ducts, GBs, and major electrical components removed (e.g., strip out), (f) radioactive hot spots and hazardous substances removed; and (g) easily removed contamination removed. (DPP, Section 2.1)

Graded Approach. A process that assures safety analysis and documentation preparation is commensurate with the magnitude of the hazards being addressed and the complexity of the facility and/or systems being relied on to maintain an acceptable level of risk.

Hazard. A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel, or damage to a facility or the environment without regard for the likelihood or credibility of accident scenarios or consequence mitigation.

Hazardous Waste. Hazardous waste is any solid waste that either exhibits a hazardous characteristic (i.e., ignitability, corrosivity, reactivity, or toxicity) or is named on one of three lists published by the EPA in 40 CFR 261, Identification and Listing of Hazardous Waste. To be considered hazardous, a waste must first meet EPA's definition of "solid waste," which includes liquids.

Individual Hazardous Substance Site (IHSS). Specific locations where solid waste, hazardous substances, pollutants, contaminants, hazardous waste, or hazardous constituents may have been disposed or released to the environment within the Site at any time, irrespective of whether the location was intended for the management of these materials.

Interim Measure. The RCRA/CHWA term for a short term action to respond to imminent threats, or other actions to abate or mitigate actual or potential releases of hazardous wastes or constituents.

Interim Remedial Action. The CERCLA term for an expedited response action performed in accordance with remedial action authorities to abate or mitigate an actual or potential threat to public health, welfare, or the environment from the release or threat of a hazardous substance from RFETS.

Involved Worker. Personnel performing work inside the Building 776/777 Complex.

Job Hazard Analysis. An analysis of procedurally controlled activities that uses developed procedures as a guide to address and consider the hazards due to any exposures present during implementation of (job) procedures, the use and possible misuse of tools and other support equipment required by the procedures, and the behavioral motivations of the people performing them. A type of hazard analysis process which breaks down a job or task into component steps, examines each step to determine what hazard(s) exist or might occur, and establishes actions to eliminate or control the hazard.

Lead Based Paint (LBP) Debris. LBP debris where the LBP and debris remain bonded; incidental separation of paint from debris does not trigger classification as hazardous waste requiring disposal at a RCRA TSD facility.

Low-Level Waste (LLW). LLW is any radioactive waste that is not classified as transuranic waste, high-level waste, or spent nuclear fuel. No minimum level of radioactivity has bee specified for LLW. LLW mixed with hazardous waste is referred to as low-level mixed (LLM) waste.

No Action with Safe Shutdown Maintenance. This alternative will maintain the 776/777 Cluster in shutdown mode. Building and equipment surveillance activities would be performed on a routine basis. No equipment or hazards would be removed from buildings in the cluster unless the routine surveys of buildings indicated a condition that would compromise the environment or public H&S. In this event, appropriate measures would be taken to mitigate the condition.

Off-Site Individual. A person located at the Site boundary (1999 meters).

Operable Unit (OU). A grouping of IHSSs into a single management unit. (RFCA ¶25[aw])

PCB Bulk Product Waste. Waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal was >50 ppm PCBs. PCB bulk product waste excludes PCBs or PCB Items; but includes: 1) non-liquid bulk waste or debris from the demolition of buildings and other man-made structures; 2) PCB-containing waste from the shredding of automobiles, household appliances, or industrial appliances 3) plastics; preformed or molded rubber parts and components, applied dried paints, varnishes, waxes, or other similar coatings or sealants; caulking; adhesives; paper, Galbestos; sound-deadening or other types of insulation; and felt or fabric products such as gaskets; 4) fluorescent light ballasts containing PCBs in the potting material.

PCB Items. Any PCB Article, Article Container, PCB Container, or PCB Equipment, that deliberately or unintentionally contains, or has as a part of it, any PCB or PCBs. This category includes electrical equipment such as transformers, capacitors and switches.

PCB Remediation Waste. Waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: (1) materials disposed of prior to April 18, 1978, that are currently at concentrations $\geq$ 50 ppm PCBs, regardless of the concentration

of the original spill; (2) materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCB beginning on April 18, 1978, or ≥ 50 ppm beginning on July 2, 1979; and (3) materials which are currently at any concentration if the PCBs are from a source not authorized for use under 40 CFR Part 761.

PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including, but not limited to the following: (1) environmental media containing PCBs, such as soil and gravel; dredged materials, such as sediments; settled sediment fines, and aqueous decantate from sediment; (2) sewage sludge containing <50 ppm PCBs and not in use according to §760.20(a) [relating to uses of sewage sludge regulated under Parts 257, 258, and 503 of 40 CFR]; (3) PCB sewage sludge, commercial or industrial sludge contaminated as a result of a spill of PCBs including sludge located in or removed from any pollution control device, and aqueous decantate from an industrial sludge; and (4) buildings and other man-made structures, such as concrete or wood floors or walls contaminated from a leaking PCB or PCB-contaminated transformer, porous surfaces and non-porous surfaces.

Physically Empty. The condition of a tank or ancillary equipment in which no liquid remains after verification by personnel who are familiar with the tank system or a by proven technology. For example, verification may be performed by draining at low points or by non-destructive testing.

Process Waste. Process waste is solid, hazardous, and mixed waste generated as a result of normal building operations and deactivation activities.

Project Baseline Summary (PBS). The PBS is a formal document that defines a project at RFETS from a DOE reporting structure standpoint. The PBS structure maintained by DOE is very similar to the PBD summary maintained by the operating contractor (see below). The primary difference is how DOE rolls the PBD up to the PBS level for reporting to DOE Headquarters.

Project Baseline Description (PBD). The PBD is a summary of the Work Planning Documents (WPDs) or Work Authorization Documents (WADs), as appropriate, that provides a broad overview of the project scope, assumptions, and other project specific summary items that collectively define the project. Items included in the PBD are the Project Purpose, Project Scope, WADs included in the PBD and a description of each, assumptions and conditions related to the project, the project execution strategy, specific safety plan for each WAD included in the PBD, Regulatory drivers, the project schedule (where to find the currently approved project schedule), and the project cost plan (summarized by WAD).

Radiological Contamination. Radioactive material present in a location where it should not be present.

Radiological Sources. Radioactive material packaged for use exclusively for its emitted radiation.

RCRA Stable. A step toward RCRA closure, whereby wastes are removed from a RCRA-regulated unit and the possibility of future waste input is eliminated. For tank systems this means a tank and its ancillary equipment have been drained to the maximum extent possible using readily available means, with the objective of achieving less than one percent holdup, and with no significant sludge and no significant risk remaining. Physical means must then be used to ensure no waste is re-

introduced to the system (e.g. lock out/tag out, blank flanges). (RCRA Part B Permit and Interim Status Closure Plan, Part X.E)

Remediation Waste. Remediation waste includes all solid, hazardous, and mixed waste; all media and debris containing hazardous substances or listed hazardous or mixed wastes, or exhibiting a hazardous characteristic; and all hazardous substances generated from activities regulated under RFCA as RCRA corrective actions or CERCLA response actions, including decommissioning under an approved decision document. Remediation waste does not include waste generated from other activities (e.g., normal building operations and deactivation activities). (RFCA ¶25[bf])

Resource Conservation and Recovery Act (RCRA). The Resource Conservation and Recovery Act, 42 U.S.C. §6901 et. seq., as amended by the Hazardous and Solid Waste Amendments of 1984, the Federal Facility Compliance Act of 1992, and implementing regulations. (RFCA ¶25[ay])

Residues (RES). Pu-contaminated liquids and solids that were once held in reserve at Rocky Flats because they contain Pu in sufficient quantities to warrant treatment for recovery of nuclear material. Residues mixed with hazardous waste are referred to as mixed residues (REM).

RFCA Standard Operating Protocol (RSOP). Approved protocols applicable to a set of routine environmental remediation and/or decommissioning activities regulated under RFCA that RFFO may repeat without re-obtaining approval after the initial approval because of the substantially similar nature of the work to be completed. Initial approval of an RSOP will be accomplished through an interim measure/interim remedial action process.

Safety Analysis Report (SAR). A report that documents the adequacy of safety analyses for a nuclear/non-nuclear facility to ensure that the facility can be constructed, operated, maintained, shut down and decommissioned safely and is in compliance with applicable laws and regulations.

Safety and Health (S&H). As defined in this DOP, a conditional state in which both the public and workers are free from harm. It is also defined as the practice and application of techniques to help prevent illness, injury, death, and property loss as a result of unintentional and undesirable conditions and acts.

Safety Authorization Basis. The combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely.

Safety-Critical Items. Equipment, systems, or components that are necessary to prevent or mitigate the harmful consequences of hazardous materials release.

Sanitary Waste.

> **Routine Sanitary Waste**. This type of sanitary waste is collected in dumpsters located throughout RFETS. Typically these wastes consist of soft or compactable items generated by office/administrative and cafeteria areas and do not required a Radiological Waste Release Evaluation prior to generation or disposal into dumpsters. Typical routine sanitary waste includes: packaging and general office refuse; food waste from cafeteria or offices; non-recyclable paper, cardboard and miscellaneous glass; metal rubber; and plastic items from routine office/administrative operations.

Special Sanitary Waste. Special sanitary waste is sanitary waste that requires specific treatment, analysis, certification, and/or packaging prior to disposal off site. Special sanitary waste includes asbestos and Be waste that is not hazardous waste.

SETs. For decommissioning purposes, SETs are small, manageable groupings of similar equipment and rooms that may be worked independently.

Special Nuclear Material (SNM). Means Pu or uranium enriched in the isotope 233 or in the isotope 235, and any other material determined to be SNM pursuant to the Atomic Energy Act. (42 U.S.C. 2014[aa]).

Standards. As defined by the Department's Standards Committee, "Standards" include "Federal, state, and local laws and regulations; Department Orders; nationally and internationally recognized standards; and other documents (such as industrial standards) that protect the environment and the safety and health of our workers and the public."

Surveillance and Maintenance (S&M). A program established during deactivation and continuing until phased out during closure to provide containment of contamination, physical safety and security controls and maintenance of the facility in a cost-effective manner that is protective of workers, the public and the environment.

To-Be-Considered Material (TBCs). Non-promulgated advisories or guidance issued by Federal or State government that are not legally binding and do not have the status of potential ARARs. However, in many circumstances TBCs will be considered along with ARARs a part of the risk assessment and may be used in determining the necessary level of cleanup for protection or health or the environment.

Transuranic (TRU) Waste. TRU waste is any waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years, in concentrations greater than or equal to 100 nCi/gram at the time of assay. TRU waste mixed with hazardous waste is referred to as TRU mixed waste (TRM).

Unreviewed Safety Question (USQ). A process to allow contractors to make physical and procedural changes and to conduct tests and experiments without prior DOE approval as long as the changes do not explicitly or implicitly affect the safety AB of the facility. It also requires that issues with a potential impact to the safety AB be brought to the attention of DOE.

USQ Screening Process. A technique/tool that uses a checklist approach to help determine if suggested changes require a full USQ determination of any effect on the safety AB of the facility.

Work Proposal Document (WPD). The WPD is a subset of the PBS, it defines the scope of work to be performed each fiscal year for each WBS element, the budget required to perform the scope, milestones planned for each WBS element and their end dates. Once approved, the WPD becomes the WAD. This authorization occurs on an annual basis once Congress has appropriated budget to DOE. Several WPDs can roll up to the PBS level but in the case of the Building 776/777 Closure Project, only one WPD (WPD 35) rolls into the summary document (PBS 19). Specific items included in the WPD/WAD are: the fiscal year statement of work (for the current fiscal year plus one year) at the WBS level; DOE- RFFO controlled and other external milestones; fiscal year specific assumptions and conditions; impact of directed funding reduction on work scope and a detailed cost

plan (budget profile) by fiscal year for each WBS element (current FY plus 1 FY); and a record of approved changes to the WAD. Several appendices accompany the WAD and provides further detail to the schedule and milestones.

WADlet. The WADlet is the next level of detail under the WAD. A WADlet is a grouping of scope with associated budget and schedule requirements to meet the scope. The WADlet is identified as a WBS element that is required to control and report specific scope conducted to meet the final objective of the WAD . Normally, several scope-similar, summary activities that leads to a significant completion milestone roll up to the WADlet level. An example for Building 776/777 is WADlet 1.1.06.12.02-SNM Removal Operations, which consists of activities such as: performing gamma scans; identifying SNM holdup contamination; verifying GB operability; entering the GB and removing the holdup; and transporting the holdup for thermal stabilization. The two primary completion milestone for this WADlet is removal of all SNM holdup from Building 776/777 and closure of the Material Access Area.

Work Task. A discrete activity made up of procedures performed in steps to achieve an objective goal such as removal of Pu from GBs, removal of a chemical from a storage area or removal of asbestos from a facility area.

12.3 References

1 FINAL Rocky Flats Cleanup Agreement, Federal Facility Agreement and Consent Order, CERCLA VIII-96-21, RCRA (3008[h]) VIII-96-01, State of Colorado Docket #96-07-19-01 (July 19, 1996).

2 Rocky Flats Closure Project Management Plan, September 3, 1998.

3 RFCA, Appendix 9, Rocky Flats Vision.

4 Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP), Revision 0.

5 Building 776/777 Reconnaissance Level Characterization Report, Rev. 0, August 28, 1989.

6 Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments (HSWA) and the Federal Facility Compliance Act (FFCAct), 42 USC 6901 *et seq.*

7 Colorado Hazardous Waste Act (CHWA), CRS 25-15-101, *et seq.*

8 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9620 *et seq.*

9 Rocky Flats Environmental Technology Site Decommissioning Program Plan (DPP), (latest version).

10 Rocky Flats Environmental Technology Site Radiological Control Manual (latest revision).

11 Integrated Work Control Program (IWCP) Manual (MAN-0710-IWCP).

12 Toxic Substances Control Act (TSCA), 15 USC 2601 *et seq.*

13 Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition, RFETS Environmental Leadership Team Environmental/Waste Compliance Guidance No. 25.

14 Waste Stream and Residue Identification Characterization and Reverification (4-H19-WSRIC-001).

15 Waste Characterization, Generation and Packaging (1-PRO-079-WGI-001).

16 Chronic Beryllium Disease Prevention Program (MAN-072-OS&H).

17 10 CFR 835, Occupational Radiation Protection.

18 DOE Order 5400.5, Radiation Protection of the Public and the Environment.

19 6 CCR 1007-3, Part 261, Identification and Listing of Hazardous Waste.

20 6 CCR 1007-3, CFR Part 268, Land Disposal Restrictions.

21 Property Management Manual (1-MAN-009-PMM), (latest revision).

22 Brown, C.M., "Evaluation of Potential Cost Impacts from Volume Reduction and Decontamination for TRU Contaminated Systems and Equipment," Kaiser-Hill Company, L.L.C. internal document, September 1998.

23 Building 776/777 Complex Basis for Interim Operation (BIO), Rev. 0, March 30, 1999 (draft), Safe Sites of Colorado, LLC.

24 DOE Order 5480.21, Unreviewed Safety Question.

25 DOE Order 440.1, Worker Protection Management for DOE Federal and Contractor Employees.

26 29 CFR 1910, Occupational Safety and Health Standards.

27 29 CFR 1926, Safety and Health Regulations for Construction.

28 Building 776/777 Closure Project-Specific Health and Safety Plan (HASP) (latest revision).

29 DOE Order 5480.9A, Construction Project Safety and Health Management.

30 RFETS Health and Safety Practices (HSP) Manual (latest revision).

31 Integrated Safety Management System Manual (1-MAN-016-ISM), (latest revision).

32 Conduct of Operations Manual (MAN-066-COOP), (latest revision).

33 Conduct of Engineering Manual (COEM), (latest revision).

34 Site Documents Control Manual (1-MAN-001-SDRM), (latest revision).

35 Training Users Manual (TUM), (latest revision).

36 Rocky Flats Administrative Procedures Manual Operations Review Requirements (1-52000-ADM-02.01), (latest revision).

37 Rocky Flats Environmental Technology Site Implementation Plan for the Nuclear Criticality Safety Manual, Rev. 2, December 2, 1996.

38 Rocky Flats Transportation Safety Manuals (PADC-94-01279), December 1995.

39 Rocky Flats Environmental Technology Site Emergency Plan (EPLAN-96).

40 Building 776/777 Emergency Response Operations, Rev. 0 (3-V95-BERO-14.776/777), (latest revision).

41 Settlement Agreement and Compliance Order on Consent Concerning Mixed Residues (99-XX-XX-XX).

42 40 CFR 761, Manufacturing, Processing, and Distribution of PCBs in Commerce.

43 National Pollutant Discharge Elimination System (NPDES) Permit No. CO-0001333.

44 Rocky Flats Cleanup Agreement (RFCA), Appendix 3, RFCA Implementation Guidance Document (latest version).

45 Compliance Order on Consent Concerning Waste Chemicals (97-08-21-02).

46 Waste Chemical Consent Order Number 97-08-21-02, Project Managers' Clarification Paper No. 3 (07/02/98).

47 Compliance Order on Consent Concerning Idle Equipment and Hazardous Waste Tanks (97-08-21-01).

48 Management Plan for Material Contained in Idle Equipment (94-MP/IE-0017).

49 Waste Characterization, Generation, & Packaging (1-PRO-079-WGI-001), Nonradioactive Waste Packaging (1-C88-WP1027-NONRAD), Solid Radioactive Waste Packaging (4-D99-WO-1100), WEMS Waste Package Verification & Certification (4-G83-WEMS-WP-1209).

50 40 CFR 300.440, National Oil and Hazardous Substances Pollution Contingency Plan, Procedures for Planning and Implementing Off-Site Response Actions.

51 5 CCR 1001-3, Regulation No. 1, Emission Controls for Particulates, Smoke, Carbon Monoxide, and Sulfur Oxides.

52 5 CCR 1001-3, Regulation No. 3, Air Pollutant Emission Notice (APEN).

53 6 CCR 1007-2, CDPHE Regulations Pertaining to the Disposal of Solid Waste.

54 National Pollutant Discharge Elimination System (NPDES) Permit No. CO-0001333.

55 Migratory Bird Treaty Act, 16 USC 701 *et seq.*

56 Fish and Wildlife Conservation Act, 16 USC 661 *et seq.*

57 40 CFR 61, Subpart H, National Emissions Standards for Emission of Radionuclides Other than Radon from Department of Energy Facilities.

58 Rocky Flats Cumulative Impacts Document (CID), (latest revision).

59 Endangered Species Act, 16 USC 1531, *et seq.*

60 Migratory Bird Treaty Act, 16 USC 701, *et seq.*

61 Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Systems (ANSI/ASQC-E4), 1994.

62 DOE Order 5700.6C, Quality Assurance.

63 Quality Assurance Program Description, (RMRS-QAPD-001), Revision 2, April 15, 1998.

64 RFETS Decommissioning Program Plan (October 8, 1998), Section 3.3.7.1, p. 24, (approved by CDPHE 11/4/98 and by EPA on 11/12/98).

65 Memorandum of Understanding Governing Regulation and Oversight of Department of Energy Activities in the Rocky Flats Environmental Technology Site Industrial Area, entered into by DOE, EPA, CDPHE, and the DNFSB on February 15, 1996.

Appendix A - SET Descriptions, Endpoints, and Hazard Matrix

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
1	**GLOVEBOX SET - Room 125 and Dimensional Metrology Lab GB** *Beryllium*: Be contaminated clothes may have been laundered in this area in the 1950s &1960s, and Be components may have been located on carts that were moved through or staged in this area. *Chemicals*: Ethyl alcohol, 1,1,1-trichloroethane and oil were used in this area up until operations were suspended. *Lead and Other Heavy Metals*: The paint on the floor may contain lead and other heavy metals; GB gloves contain lead. *PCBs*: PCBs may be contained in paint. A PCB determination of ballasts will be made when the ballasts are removed. *SNM Holdup*: SNM holdup is not expected in this SET since the critically limits were "No Fissile Materials." *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surface. There is fixed contamination on the floor and walls from the 1969 fire and major leaks from the GBs.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping conduit Remove/dispose of utilities Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles CBDPP	TRU, TRM, LLW, LLM
2	**ROOM SET - Rooms 126, 132, 133, 137B** *Lead and Other Heavy Metals*: The paint on the floor may contain led or other RCRA heavy metals. The solder and printed circuit boards contain regulated quantities of lead.	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria		None	PPE	LLW, LLM
3	**EQUIPMENT SET - Hydraulic Oil System, 2nd Floor in Room 233A** *Chemicals*: The unit contains a significant quantity of hydraulic oil.	Deactivation: Remove/dispose of loose combustibles Drain/isolate utility systems Decommissioning: Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals*: Hydraulic oil	None	PPE	LLW

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
4	**GLOVEBOX SET - Portion of Room 131 East/West D-Line and GBs 601, 602, 604, 605, 606, 608 and 612 (including Mixed Residue Tanks DL-776 & V-605 [2])** *Beryllium*: Be was machined in GB-605. *SNM Holdup*: Several of the GBs currently contain significant Pu holdup. *Radiological*: *Contamination:* The GBs are expected to be contaminated >10^6 cpm on the inner surfaces.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous material Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles CBDPP	TRU, TRM, LLW, LLM
5	**GLOVEBOX SET - Portion of Room 131 East/West D-Line and GBs 601, 602, 605, 606, 608 (including Mixed Residue Tanks V-614, V-616, V-618, and V-620)** *Chemicals*: Carbon tetrachloride and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane) were used as solvents in these GBs. Texaco Regal #643 lubricating oil was used as a coolant to cut Pu parts. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. The paint on the GBs may contain lead or other heavy metals. Leaded glass contains regulated quantities of barium and lead. *SNM Holdup*: Several of the GBs contain significant Pu holdup. *Radiological Contamination*: The GBs are expected to be contaminated.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria		None	PPE	LLM, TRU

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
6	**GLOVEBOX SET - Portion of Room 131 North/South D-Line and GBs 626-628, 630, 632, 636, and 642 (including Mixed Residue Tanks V-626 and V-627)** *Beryllium*: Be contaminated oil is present in this area. *Chemicals*: Carbon tetrachloride and Freon TF (1,1,2, trichloro-1,2,2-trifluoroethane) were used as solvents in these GBs. Texaco Regal #643 lubricating oil was used as a coolant to cut Pu parts. *Lead and Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. The paint on the GBs may contain lead or other RCRA heavy metals. Leaded glass contains regulated quantities of barium and lead. *SNM Holdup*: Several of the GBs contain significant Pu holdup. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. Several of the GBs have less fixed contamination on the exterior; they are individually marked. The optical comparator may be contaminated with U-235.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals:* Oil *SNM Holdup Measurements* *Radiological Surveys*	Beryllium	PPE CBDPP	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
7	**TANK SET - Tanks 1103 (RCRA Unit 95.006), 1104 (RCRA Unit 95.007), 1106 (RCRA Unit 95.008) and associated ancillary equipment in Room 131** *Beryllium:* There is the possibility that liquids stored in the tank may be Be contaminated from Building 707 operations. *Chemicals*: Carbon tetrachloride and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane) were used as solvents in some of the GBs. Lubricating oils was used as a coolant to cut Pu parts. In the 1970s perchloroethylene was used in place of carbon tetrachloride in certain operations. *Lead & Other Heavy Metals*: The paint on the tanks might contain lead & other heavy metals. Based on historical analysis, there are detectable levels of barium, chromium and lead in the sludge. *SNM Holdup:* The tanks have significant Pu holdup. High hold-up levels will be reduced to below safeguards termination limits during deactivation activities (ring and sludge removal). *Radiological Contamination:* The tanks are assumed to be externally contaminated with Pu since they are in contamination control houses.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Liquids* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRM
8	**ROOM SET - Rooms 120, 130B, 131 (RCRA Unit 90.49), 131A, and Dock 1** *Chemicals*: Carbon Tetrachloride and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane) were used as solvents in the GBs located in Room 134E. Lubricating oil was used as a coolant to cut Pu parts. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead & other heavy metals. Printed circuit boards in the control equipment will be handled as RCRA waste doe to lead in the solder. The incandescent and fluorescent lights may contain lead and mercury, respectively.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria		None	PPE	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
9	**ROOM SET - Room 134E** *Chemicals*: Carbon tetrachloride and Freon TF were used as solvents in the GBs. Lubricating oil was used as a coolant to cut Pu parts. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead & other heavy metals. The gloveport covers and aprons in the cabinet contain lead. Printed circuit boards in control equipment will be handled as RCRA waste due to the lead in solder. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. Any paint analyzed for lead & other heavy metals will be analyzed for PCBs. *Radiological Contamination:* There are several High Contamination Areas in GBs; the contamination is mainly in the form of Pu-contaminated oil. It is assumed that the fixed contamination under paint on the floors is the same as the contamination levels detected after the 1969 fire (i.e., $>10^6$ cpm/cm^2).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Radiological Surveys*	High radiological contamination areas	PPE Radiological Controls/ ALARA Principles	LLW, LLM
10	**GLOVEBOX SET - Room 134E, GBs 505, 509, 751, 752, 624 and Associated M-Line & North/South D-Line (including Mixed Residue Tank V-752)** *Chemicals*: Carbon tetrachloride, 1,1,1-trichloroethane and Freon TF were used as solvents in these GBs. Texaco Regal #643 lubricating oil was used as a coolant to cut Pu parts. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. The paint on the GBs may contain lead or other heavy metals. *SNM Holdup*: GB 752 contains significant Pu holdup that will be removed prior to decommissioning. *Radiological Contamination*: The GBs are expected to be contaminated to $>10^6$ dpm Pu on the inner surfaces.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurements* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
11	**GLOVEBOX SET - Room 134E, GBs 746, 747, 748, 749, and Associated M-Lines, (including Tank T-7 [RCRA Unit 95.014] and Mixed Residue Tanks V-746, V-747, V-748, & V-749)** *Chemicals*: Carbon Tetrachloride and Freon TF were used as solvents in these GBs. Texaco Regal #643 lubricating oil was used as a coolant to cut Pu parts. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. Leaded glass on the GB contains regulated quantities of barium and lead. The paint on the GBs may contain lead and other heavy metals. *SNM Holdup*: GB746 contains significant Pu holdup; several of the remaining GBs contain measurable Pu holdup. GBs 746, 748, and 749 contain less than 15 grams uranium (U) holdup each. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surface. Several of the GBs have less fixed contamination on the exterior.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurements* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
12	**ROOM SET - Rooms 401, 402, 402A, 403, 404, 405, 406, 407, 409, 410, and 411** *Asbestos*: Rooms 495 and 410 have tile floors that may contain asbestos. There may be floor tile is under the carpet in Room 408 that may contain asbestos. *Beryllium*: Based on the type of work performed in Room 408, Be is likely to be present. Be contamination has been detected in Room 401. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: PCBs may be in fluorescent light ballasts. Any paint sampled for lead or other heavy metals will be sampled for PCBs. *Radiological Contamination*: There is fixed contamination in Rooms 402, 402A and 411 beneath the paint on the floor and original walls as a result of the 1969 fire. Floor contamination levels after the fire were up to 10^6 cpm.	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles CBDPP	LLW, LLM, SAN, HAZ

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
13	**ROOM SET - Rooms 416, 416B, 417, 418, 419, 420, 429, 431, 431A, and 431B** *Asbestos*: There are floor tiles in Room 419 that may contain asbestos. *Beryllium:* A grit blaster for Be parts was operated in Room 416 in the 1960s. R&D welding was performed in Room 416 in the same time period. Be contamination has been detected in Room 416.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium*	Beryllium	PPE BCDDP	LLW

	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
14	**ROOM/EQUIPMENT SET - Room 415 and associated GBs 201 through 205, 207 through 214, and 216 through 222** *Beryllium*: R&D welding was performed within Room 416 in the 1960s. *Chemicals*: 1,1,1-Trichloroethane was used to clean specimens and wet the grit for polishing within the GBs. Ethanol was also used to clean specimens. A kerosene/diamond paste mixture was used in the polishers. Inorganic chemicals used in the GBs include electrolytic solution, oxalic acid and sodium hydride. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. The incandescent and fluorescent lights can contain lead and mercury, respectively. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. Any paint analyzed for lead & other heavy metals will be analyzed for PCBs. *SNM Holdup*: To be determined. *Radioisotope Sources*: The sources from the alphamet monitors in Room 415 will be removed during deactivation. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surface. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 250 – 10^6 cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
15	**ROOM SET - Room 416A (Vault)** *Beryllium*: Be parts were stored on carts. R&D welding was performed in the 1960s. Be may have been welded or brazed in the equipment located in this room. *Lead & Other Heavy Metals*: The paint on the floor and wall may contain lead and other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 – 10^6 cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
16	**ROOM SET - Rooms 426, 427, 427A, and 428** *Beryllium*: Be has been detected in the hood above the washing machine. There are no records to indicate the source of Be contamination. *Chemicals*: Soaps, detergent, and bleach were used within Rooms 426, 427 and 428. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - 10^6 cpm). The drains from the process sinks are assumed to be contaminated based on their usage.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM
17	**GLOVEBOX SET - Room 430, GB 481** *Chemicals:* A catalyst column is filled with palladium metal that is mounted to the Superdry facility wall. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. The paint on the GBs may contain lead or other RCRA heavy metals. Leaded glass on the GBs contains regulated quantities of barium and lead. *Radiological:* Since the GB was never used, there is no contamination inside the GB. However, since the outside of the GB is painted, the GB may not be free released.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Radiological Surveys*	None	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
18	**GLOVEBOX SET - Room 430, GBs 360, 361, 362, 363, 364, 367, 368, 369, 370, 371, 372, 373, 465, and associated G2-Line** *Chemicals*: Carbon tetrachloride and Freon TF were used as solvents in these GBs. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. The paint on the GBs may contain lead or other RCRA heavy metals. Leaded glass on the GBs contains regulated quantities of barium and lead. *PCBs*: PCBs may be present in paint. *SNM Holdup:* GB 362 contains Pu holdup. No measurable U holdup has been detected to date. There are other GBs in this SET where holdup is not yet determined. *Radiological Contamination:* The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. Several of the GBs have less fixed contamination on the exterior; they are individually marked.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurements* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
19	**ROOM SET - Room 154A** *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (10^5 – 10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
20	**GLOVEBOX SET - Room 430, GBs 401, 402, Hood Area, and Room 424** *Beryllium*: Be was machined in GBs 401 and 402. Be salts were handled in the hoods in Room 424. Surveys confirmed the presence of Be in these areas. *Chemicals:* 1,1,1-trichloroethane was used on wipes within the GBs. Oil from the vacuum pumps will be removed during deactivation. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: Not determined. The two lathe B-boxes will be scanned for holdup. *Radiological Sources*: There are two registered sources in Room 424. These sources will be removed during deactivation. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., $>10^5$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
21	**GLOVEBOX SET - Room 430, GBs 403, 404, 405, 408, 409, 413, 426, 427, 450, and associated A-Line** *Beryllium*: Be was handled in GB427. *Chemicals*: 1,1,1-trichloroethane was used on wipes and inside the ultrasonic cleaner/vapor degreaser within the GBs. Oil from the vacuum pumps will be removed during deactivation. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It has not been determined if there is holdup in the GBs. *Radiological Sources*: The sources in the alphamet monitors will be removed during deactivation. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. Some of the GBs may be internally contaminated with enriched U.	Deactivation: Remove/repackage classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility system Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
22	**GLOVEBOX SET - Room 430, GBs 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 451, 452, 454, 456, 457, 458, 459, 462, 464 and associated A-Line** *Beryllium*: Be was handled in GBs 448, 451, 451 and 454. *Chemicals*: 1,1,1-trichloroethane was used on wipes and inside the ultrasonic cleaner/vapor degreaser within the GBs. Oil from the vacuum pumps will be removed during deactivation. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It has not yet been determined if these GBs contain holdup. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. Some of the GBs may be internally contaminated with enriched and depleted U.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
23	**GLOVEBOX SET - Room 430, GB 515, associated R-Line, and GBs 318, 320, 321, 323, 324, 327, 328, 329, 330, and 331** *Chemicals*: Carbon tetrachloride, 1,1,1-trichloroethane and Freon TF were used on wipes in the GBs. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. There are lead counterweights on the equipment in GB 318. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It has not yet been determined if these GBs contain holdup. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces.	Deactivation: Remove/package classified Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurements* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLW
24	**GLOVEBOX SET - Room 430, GBs 756, 758, 759, 760, 761, 762, 763, 764, and associated M-Line** *Chemicals*: Carbon tetrachloride and Freon TF were used on wipes within the GBs. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. There are lead counterweights on the equipment in GB 758. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It has not yet been determined if these GBs contain holdup. *Radiological Sources*: The sources in the alphamet monitors will be removed during deactivation. *Radiological Contamination*: The GBs (except GB 764) are expected to be contaminated >10^6 dpm Pu on the inner surface. The outer surfaces of the GBs are contaminated up to 250,000 dpm. GB 764 was never used and has little or no radioactive contamination.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurements* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
25	**ROOM SET - Room 430, including RCRA Unit 777.1 (i.e., Areas 2 & 3)** *Asbestos*: There is insulation on small tank(s) and tritium dryers in this SET. This insulation will be managed as asbestos waste. *Beryllium*: Be was machined in GBs 401 and 402 in Room 430. Be salts were handled in the hoods in Room 424, which is on the southern border of this SET. Previous surveys have confirmed the presence of Be contamination. *Chemicals*: Water in Tank RT-1 and oil in the vacuum pumps will be drained during deactivation. *Lead & Other Heavy Metals*: There is lead metal on the drum shields and leaded gloves stored in this room. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radioactive Sources*: Sources on combo monitors will be removed during deactivation. *Radiological Contamination*: Gettering system tank RT-1 is marked as Pu and tritium contaminated.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium Tritium	PPE CBDPP Radiological Controls/ ALARA Principles	LW, LLM
26	**TANK SET - Room 430, Tanks T-1 (RCRA Unit 95.015) , T-2 (RCRA Unit 95.016), and FL-1** *Beryllium*: Be metal was not routinely cleaned in ultrasonic cleaners after the late 1960s –early 1970s. Prior to this period, an ultrasonic cleaner for grit blasted Be parts operated in Room 418. It is not clear if the SET 26 tanks were installed before or after the ultrasonic cleaner was removed from Room 418. *Chemicals*: 1,1,1-trichloroethane was stored in the tanks. Prior to 1974, trichloroethylene was used in place of 1,1,1-trochloroethane. *Lead & Other Heavy Metals*: The paint on the tanks and filter GB may contain lead or other RCRA heavy metals. *PCBs*: PCBs may be present in paint. *SNM Holdup*: The tanks were scanned in 1990 and 1994 for holdup. The holdup is less than 50 grams per tank. Holdup levels will be reduced during deactivation. *Radiological Contamination*: The tanks are assumed to be externally contaminated with Pu since they are in contamination control houses.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium	PPE CBDPP	TRU, TRM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
27	**ROOM/EQUIPMENT SET - Rooms 432, 432A, 432B, 432C (RCRA Unit 777.1), 432D, 440, and GB 461** *Asbestos*: A small oven in this SET is insulated with Transite. *Beryllium*: Be parts were stored, cleaned and assembled in the Superdry facility. *Chemicals*: 1,1,1-trichloroethane was used in the ultrasonic cleaners in Room 440. Prior to 1974, trichloroethylene was used in place of 1,1,1-trichlorethane. The oil in the machinery will be removed during deactivation. A palladium metal filled catalyst column for SET 17 is attached to the north exterior wall of the SET. *Lead & Other Heavy Metals*: There is lead metal stored in the room. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It is not yet determined if the lathes in Room 432D and the downdraft table in Room 432B contain SNM holdup. *Radiological Contamination*: There are used tritium dryers with unknown levels of contamination. Depleted and enriched U contamination is possible in this SET. Room 432B and the lathe in Room 432D are posted as high contamination areas. The posted contamination within Room 432B is 500,000 cpm.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium Tritium	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, LLW, LLM
28	**ROOM SET - Room 433** *Beryllium*: Be parts were handled in this area in the 1960s and may have been transported through the room after the 1960s. Be contamination has been found near SET 28 in SET 20. *Chemicals*: The flammable cabinets contain two drums of epoxy and catalyst. These drums will be removed during deactivation. *Lead & Other Heavy Metals*: There is a leaded glove and a box of leaded glass stored in the room. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: A transformer in the SET is marked as having 50,000 dpm fixed contamination.	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
29	**GLOVEBOX SET - Room 437, GB A1, A2 and A3, and associated conveyor lines** *Beryllium*: Leak detector parts stored in the room have manufacturer warnings regarding Be in the ceramic rings. *Chemicals*: 1,1,1-trichloroethane and Freon TF were use as solvents in these GBs. Containerized chemicals will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. Leaded GB covers, gloves, and an apron are stored in the cabinets. Leaded glass in the GB windows contains regulated quantities of barium and lead. The paint on the floors, walls and GBs may contain lead or other RCRA heavy metals. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: GBs A-1 and A-2 have been scanned for Pu holdup. While these GBs contain gram quantities of Pu, the holdup does not require remediation prior to decommissioning. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. The maximum fixed contamination on the exterior of the GBs is 100,000 dpm. An electrical cabinet in the room is marked as containing fixed contamination. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 to 10^6 cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
30	**ROOM SET - Room 442** *Beryllium*: Be parts were x-rayed and stored in this area. *Chemicals*: Freon gas will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead metal located in the room. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is no indication of radiological contamination in this room.(surveys).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
31	**ROOM/EQUIPMENT SET - Room 443 (including RCRA Unit 777.1) and NDT Line** *Beryllium*: Be parts may have been stored on carts in Room 443. *Chemicals*: A small cylinder of sulfur hexafluoride will be removed during deactivation. Any liquids (i.e., oil or water) in the x-ray unit or GBs will be drained. Carbon tetrachloride has been used in the GBs in the past. *Lead & Other Heavy Metals*: There is lead metal stored in the room and lead shielding within the x-ray unit. There is a thermometer on the X-ray unit that contains mercury. There is lead metal located in the room. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: Not yet determined. The GBs need to be scanned prior to packaging in waste containers, as required by the current criticality controls. *Radiological Contamination*: The GBs are expected to be contaminated $>10^6$ dpm Pu on the inner surfaces. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., $>10^5$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
32	**ROOM SET - Room 436, 444, 446, 447, 448 (RCRA Unit 777.1), 449, and 450** *Asbestos*: Rooms 444 and 450 have suspended ceiling with that may be made of asbestos tile. *Beryllium*: Be parts may have been radiographed or stored on carts in Rooms 448 or 449. *Chemicals*: Any liquids (i.e., oil or water) in the x-ray unit, including hydraulics, will be drained. The water in the water walled storage positions and the batteries in Room 448 will be drained after the SNM is removed from the vault during deactivation. *Lead & Other Heavy Metals*: There is lead metal stored in Rooms 447, 448, and 449. There is lead shielding within the cobalt sources in Room 449 and the can storage positions in Room 448. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radioactive Sources*: The Cobalt-60 and alpha met sources will be removed during deactivation. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., $10^5 > 10^6$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
33	**ROOM/EQUIPMENT SET - Room 445 and GBs 494, 495, 499, 500, 501, and 502** *Asbestos*: A heating mantle will be managed as asbestos waste unless sampling or manufacturer information indicates the material is non-asbestos. *Beryllium*: Be was welded in the PIGMA welder. Be metal is stored in the cabinet north of the PIGMA welder and in a desk near Room 458. Be parts may have been handled within the environmental test chamber and GBs. *Chemicals*: Oil from the vacuum pumps and hydraulic units will be removed during deactivation. The refrigerant from an environmental test chamber will be removed prior to decommissioning. The can of magnesium oxide below GBs 494 and 494 will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding, leaded glass, leaded aprons, and leaded gloves stored in cabinets. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *SNM Holdup*: GBs 494 and 495 have been scanned for holdup. The holdup in these two GBs does not require remediation prior to GB removal. The other four GBs in the SET need to be scanned. *Radiological Contamination*: The inside surfaces of the GBs are contaminated with >10^6 dpm. There is up to 10,000 dpm of fixed contamination on the exterior of the GBs. There is fixed contamination on a section of bagged ductwork, a downdraft vacuum, and room exhaust ducts. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., $10^5 > 10^6$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
34	**ROOM/EQUIPMENT SET - Room 452 (including Mixed Residue Tank V-022) and Room 475, GBs 022, 027, 029, 034, 035, 522, 548 and associated H-Line** *Beryllium*: Pits with Be were disassembled within the inert system. Machining necessary to disassemble the pits would contaminate the inside of the GB with Be. *Chemicals*: Oil from the vacuum pumps and hydraulic units will be removed during deactivation. The can of magnesium oxide in GB 034 will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding, leaded glass, and leaded gloves on the GBs. A mercoid switch contains mercury. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: Not yet determined. *Radiological Contamination*: The inside surfaces of the GBs are contaminated with >10^6 dpm. There is up to 40,000 dpm of fixed contamination on the vacuum pumps and associated motors below the GBs. The contamination beneath the paint on the GBs cannot be measured due to the paint shielding the alpha particles.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
35	**GLOVEBOX SET - Room 452, GBs 026, 526, 524, 525, 526, 527, 528, 530, 532, 537, 538, 541, and associated H-Line** *Asbestos*: The insulation associated with the muffle furnace in GB 523 and the heating chamber in GB 528 may contain asbestos. Manufacturer information or sampling may be used to characterize the insulation. *Beryllium*: Mixed Be/Pu chips were oxidized within the furnace in GB 523. Be parts may have been handled within the environmental test chamber and GBs. *Chemicals*: Oil from the vacuum pumps and hydraulic units will be removed during deactivation. The refrigerant from the environmental test chamber will be removed prior to decommissioning. Containerized chemicals will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding, leaded glass, and leaded gloves on the GBs. There is a lead hammer in GB 537. The geometry tank in GB 524 is lined with cadmium. The parts processed in the GBs were made of or coated with a variety of unspecified metals. Any metal fragments or chips discovered in the GBs will be characterized. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: Not yet determined. *Radiological Contamination*: The inside surfaces of the GBs are contaminated with >10^6 dpm. The downdraft rooms have been surveyed as 1,000,000 dpm fixed + removable inside. There is up to 20,000 dpm fixed contamination on the exterior of the GBs. The contamination beneath the GB paint cannot be measured due to the paint shielding the alpha particles. The cylinders extending into the raschig ring filled pit beneath GB 528 are Pu contaminated. Depleted and enriched U contamination is possible in these GBs. Tritium releases occurred in GB 532 in the 1960s and 1970s. Parts exposed to radiation blasts at NTS were disassembled in the GBs. Residual activation or fission product contamination will need to be addressed.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination Tritium Activation products Fission products	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
36	**ROOM/EQUIPMENT SET - Room 452 (including Mixed Residue Tank V-543) and Room 475 with GBs 536, 544, and 543 and machining equipment** *Asbestos*: The high temperature gloves and heating mantles will be managed as asbestos waste unless sampling or manufacturer information indicates these are non-asbestos. *Beryllium*: Be was machined in GB 543. Historical Be surveys confirm the presence of Be contamination near this GB. The argon system in the mezzanine is potentially contaminated internally with Be. *Chemicals*: Oil from the vacuum pumps and hydraulic units will be removed during deactivation. The can of magnesium oxide will be removed during deactivation. The oxygen getter is identified as Dow Q1. This material needs to be characterized. The desiccant is a zeolite. *Lead & Other Heavy Metals*: There are lead vise covers, lead bricks and lead hammers in the rooms. There is lead tape and leaded glove covers stored in the cabinets. Paint on walls and floors may contain lead and other heavy metals. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The columns for the gettering material and desiccant will be scanned for holdup. *Radiological Contamination*: There is up to 10,000 dpm of fixed contamination on the hoods, table, and room exhaust duct. In the early 1960s, a contamination incident from a coating machine dispersed Pu and gold contamination throughout Room 452. The contamination from this incident is in the range of the fire contamination.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
37	**ROOM SET - Rooms 453, 454, 460, and part of Room 445 (south end)** *Beryllium*: Be metal samples were found in Room 453. Be parts may have been handled within the testing equipment. Surface surveys will be performed prior to initiating decommissioning activities. *Chemicals*: Oil from the compressors and hydraulic units will be removed during deactivation. The refrigerant from the environmental test chamber will be removed prior to decommissioning. *Lead & Other Heavy Metals*: The paint on the floor, walls and accelerators may contain lead or other RCRA heavy metals. Fluorescent lights contain mercury; these lights will be managed as hazardous waste. The room thermostats may contain mercury. Some of the internal parts of the horizontal accelerator are cadmium plated. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination on the exterior of the horizontal accelerator including the sandbags. The contamination beneath the paint on the accelerator can not be measured due to the paint shielding the alpha particles. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - $>10^6$ cpm).	<u>Deactivation</u>: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials <u>Decommissioning</u>: Drain/isolate fluid systems Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurements* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
38	**ROOM SET - Rooms 301, 302, 455, 456, 457, 458, and 481** *Asbestos*: The floor tile in Rooms 302 and 302 may contain asbestos. *Beryllium*: The tool cutter in Room 461 is marked as Be contaminated. Be metal parts were handled in Rooms 455 and 457. *Chemicals*: Oil in the equipment will be drained during deactivation. The containerized chemicals (salt, calcium sulfate) in Room 458 will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead glass in Room 457. There are printed circuit boards and a lead apron in Room 458. Lead scrap, lead security seals, and a lead-shielded cart are contained in this SET. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. The switchgear will be inspected for PCB capacitors when it is removed. An obsolete power supply in Room 302 will be inspected for PCB fluid when it is removed. *Radiological Contamination*: There is fixed contamination in and on the equipment in Rooms 302 (power supply, surface plate) and 455 (pumpdown table, hood). There is fixed contamination on bagged tools within cabinets in several of the rooms. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - 10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Chemicals* *Beryllium* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
39	**ROOM SET - Rooms 459 and 459A** *Beryllium*: Be metal parts may have been pressure tested in Room 459A. *Chemicals*: Oil or other liquids in the equipment will be removed during deactivation. The container of water in Room 459 will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead metal and circuit boards in Room 459. There is a mercury switch in this SET. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent lights contain mercury; these lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. The InductoTherm furnace contains capacitors filled with Pydraul dielectric fluid. *Radiological Contamination*: There is 2,400 dpm fixed contamination on a room exhaust duct. Depleted U contamination is possible in the pressure test units. There is fixed contamination beneath the paint on the floor and the building walls from the 1969 fire. It is assumed that floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - 10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM
40	**ROOM SET - Room 462, "A" Vault** *Beryllium*: Be metal parts have been stored on carts or in shipping containers in Room 462. *Chemicals*: Tubes of vacuum grease, sealant and containers of cleaning supplies will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead metal, leaded glass and leaded aprons stored in Room 462. There is lead shielding on the benelex wall. The paint on the floor and walls may contain lead or other RCRA heavy metals. The room thermostat may contain mercury. Fluorescent light fixtures contain mercury and will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The SNM in the vault is stored with containment (i.e. metal can, plastic bags, within a pit) at all times. Therefore, holdup is not an issue. *Radiological Contamination*: The map of floor contamination levels after the 1969 fire indicates contamination from the fire did not spread to the vault.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
41	**ROOM/EQUIPMENT SET - Room 463 and GBs A4, A5, A6, A7, A8, A9, and A11** *Beryllium*: Leak detector parts stored in the room have manufacturer warning regarding Be in the ceramic rings. There are Be metal discs stored in one of the cabinets. The north end of the room was once part of Room 464, which contained furnaces to "bake out" Be parts. *Chemicals*: Ethanol and Freon TF were used as solvents in these GBs. All liquids will be drained prior to decommissioning activities. Containerized chemicals will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on GBs. Leaded GB covers gloves, printed circuit boards with lead solder, and leaded aprons are stored in cabinets. Leaded glass on the GBs contains regulated quantities of barium and lead. The vacuum pump connected to GB A-7 is assumed to contain mercury until the pump liquid can be verified to be mercury or oil. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: GBs A-4, -5 and –11 have been scanned for Pu holdup. The Pu in these GBs does not require remediation prior to decommissioning. While enriched U was handled in these Gabs, measurable U holdup has not been detected to date. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. The maximum fixed contamination on the exterior of the GBs is 600,000 dpm. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^4$ cpm). An electrical cabinet in the room is marked as containing fixed contamination.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
42	**ROOM SET - Rooms 464, 477, 477A, 463A, and 463B** *Asbestos*: The insulation on the water pipes in Room 463B is visually identified as fiberglass insulation (confirm as non-asbestos). The floor tile in Rooms 477 and 477A may contain asbestos. *Beryllium*: Be parts were baked to remove moisture in Room 464 during the 1960s. *Chemicals*: Water from process tank in Room 463B will be drained during deactivation. The refrigerant and oil from the air conditioner in Room 464 will be removed during deactivation. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Sources*: The alphamet sources in Room 463A will be removed during deactivation. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^4$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Drain/isolate/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Liquids* *Chemicals* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM
43	**ROOM SET - Rooms 465, 465A, and the north end of Room 445** *Beryllium*: Be parts were stored in packages in Room 465. At least one pressure cooker in Room 465 is marked as internally contaminated with Be. There is Be contaminated equipment in Room 445 in SET 33, which is south of SET 43. *Chemicals*: Containerized chemicals (Bonami, 1,1,1-trichloroethane, oil, Oakite, water) in and near the two hoods in Room 445 will be removed during deactivation. *Lead & Other Heavy Metals*: There are printed circuit boards with lead solder, lead-taped vials, lead bricks, and leaded aprons in this SET. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury and will be managed as RCRA hazardous waste. Thermostats in the room may contain mercury. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. Radioactive Sources: The combo source will be removed during deactivation. *Radiological Contamination*: Fixed contamination exists within the used pressure cookers in Room 465A. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^3 - $>10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
44	**ROOM SET - Rooms 466, 467, 468, 469, 470, 471, 472, 474, and 474D** *Beryllium:* Be parts were moved on carts through the hallway and radiographed in Room 471. Be windows were used to filter out low energy X-rays on the low keV in Room 471. *Chemicals*: Any liquids (i.e. oil or water) will be drained from equipment during deactivation. Containers of oil and Freon will be removed during deactivation. *Lead & Other Heavy Metals*: Pieces of lead metal are stored in Room 471. There is lead shielding on the sources and in the door to Room 471. There are leaded gloves and lead shielding on the GB in Room 472. The radiography film in Room 474D may contain regulated quantities of heavy metals such as cadmium based on information from Kodak. Equipment that contacted the fixer solution will be contaminated with silver. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights may contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: It has not yet been determined if the GB and tank in Room 472 contain holdup. *Radioactive Sources*: The sources in Room 471 will be removed during deactivation, including the depleted U pig used for shielding. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^5$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
45	**ROOM SET - Rooms 473 and 476** *Beryllium:* Be parts may have been radiographed and stored on carts in Room 473. *Chemicals*: Sulfur hexafluoride is an insulating gas within the x-ray device. Any liquids (i.e., oil or water) in the x-ray unit will be drained. *Lead & Other Heavy Metals*: There are leaded gloves and pieces of lead metal stored in the room. The door to Room 473 and the storage rack doors in Room 476 contain lead metal. There is lead shielding within the x-ray unit and on the floor. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radioactive Sources*: The gamma alarm and radiography sources will be removed during deactivation. *Radiological Contamination*: Fixed contamination exists within the x-ray unit. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^4$ cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM
46	**ROOM SET - Room 478, "B" Vault** *Beryllium*: Be metal parts have been stored on carts or shelves in Room 478. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^4$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
47	**ROOM SET - Rooms 479, 481, 482, 483, 483A, and 483B (including RCRA Unit 777.1 [i.e., Rm. 483, Area 8])** *Beryllium*: Be parts are stored in Room 483A. Be parts may have been stored or moved through other rooms in this SET. *Chemicals*: Containerized chemicals near the forklift charging station (water, sodium bicarbonate, and magnesium oxide) will be removed during deactivation. *Lead & Other Heavy Metals*: There is lead shielding from shipping containers and lead bricks stored in Room 482. Leaded aprons are stored in Room 481. Room thermostats may contain mercury. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radioactive Sources*: The source on the combo monitor in Room 481 will be removed during deactivation. *Radiological Contamination*: The depleted U parts stored in Room 483A will be removed during deactivation. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^5$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
48	**EQUIPMENT SET - Kathabar System (except inside plenums)** *Asbestos*: The insulation on the Kathabar K-1 is listed in the asbestos inventory. Insulation on the remaining units will be managed as asbestos. *Chemicals*: The brine in the units will not be drained until decommissioning because cooling of the air is needed to keep the building temperatures comfortable. *Lead & Other Heavy Metals*: Kathene sludge has been analyzed and shown to contain regulated amounts of cadmium, chromium and lead. *Radiological Contamination*: There is no known radiological contamination of the Kathabar units except for the GBDA Kathabar (SET 72). Since the equipment is not completely surveyable, the equipment will be disposed of as radiologically contaminated.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals*	Cadmium Chromium	PPE	LL.W, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
49	**ROOM SET - Modulab** *Asbestos*: The gloves used for handling thermally hot samples will be managed as asbestos waste. *Beryllium*: The lapping machine in the Modulab is marked as Be contaminated. There is a portion of a Be ingot and other pieces of Be stored in a cabinet. Be has been detected on smears taken from the Modulab. *Chemicals*: The column of dierite (calcium sulfate) will be removed during deactivation. Ethanol and varsol were used as solvents in the lapping process. Oil from the hydraulic systems and vacuum pumps will be drained during deactivation. *Lead & Other Heavy Metals*: Lead metal is located in cabinet drawers. *PCBs*: The InductoTherm furnace contains capacitors filled with Pydraul dielectric fluid. A PCB determination of ballasts will be made when the ballasts are removed. *Radiological Contamination*: There are depleted U metal samples in the Modulab. Some of the equipment may be contaminated with depleted U. According to OSAs for the processes, Pu was no processed in the Modulab. Based on the contamination map form the 1969 fire, the Modulab was not internally contaminated.	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
50	**ROOM SET - Rooms 101, 102, 103, 103A, 104, 104A, 104B, 104C, 104E, 106A, 106D, 107, 107D, 107E, 108, 108A, 108B, 108C, 109, 109A, 109C, 109D, 110, 112, 112A, 112B, 113, 113B, 113C, 114, 116B, 117, 119, 120, 121, 129, 140, and 149** *Asbestos*: May be present in floor tiles. *Chemicals*: Cleaning supplies in this SET will be removed prior to decommissioning. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radioactive Sources*: Sources will be removed prior to decommissioning. *Radiological Contamination*: There is fixed contamination beneath the paint and floor tile. It is assumed that contamination levels are the same as those after the 1969 fire (i.e., 250 – 10^6 cpm). The offices were extensively decontaminated after the fire; however, contamination has been discovered when floor tile has been removed. Small amounts of contamination have been discovered in a light fixture in Room 129.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
51	**GLOVEBOX SET - GBs in Room 154A: 046, 494 (cold box adjacent to GB 495), 495, 496, 499, 501, 502, 503, 505, 506, and 507** *Chemicals*: Freon refrigerant was used to cool the furnaces. Water from the water wall shielding and oil from the vacuum pumps will be drained during deactivation. *Lead & Other Heavy Metals*: There is lead shielding and leaded gloves on the GBs. Leaded glass contains regulated quantities of lead and barium. The paint on the floor and walls may contain lead or other RCRA heavy metals. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: GBs 495, 496, 501 and 502 contain significant Pu holdup, which will be remediated to safeguards termination limits prior to decommissioning. No measurable U holdup has been detected. *Radiological Contamination*: The GBs are expected to be contaminated >10^6 dpm Pu on the inner surfaces. The fixed contamination on the exterior of the GBs ranges from 10,000 dpm to 1,000,000 dpm. Americium contamination in GBs 046, 499, 501, 502 and 503 contain greater than 1000 ppm Am in the Pu.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals* *SNM Holdup easement* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
52	**EQUIPMENT SET - Tanks T-360 (RCRA Unit 94.007) and T-370 (RCRA Unit 94.008), plus GBs 361 and 371 and Bermed Area** *Beryllium*: There is no record of Be processing in this area. Surface surveys will be performed to verity there is no contamination. *Chemicals*: Any liquids in the tanks will be drained during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the filter GBs. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. *SNM Holdup*: Not yet determined for the tanks and GBs. The tanks and the GBs will need to be "gram estimated" prior to removal to comply with the current criticality control requirements for waste boxes. *Radiological Contamination*: The tanks and GBs may or may not be contaminated inside. Radiological surveys are needed.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	None	PPE	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
53	**ROOM SET - Room 152 Vault (RCRA Unit 90.85)** *Beryllium*: The criticality limits did not allow the storage of Be. Surface surveys will be performed prior to initiating decommissioning to confirm there is no Be contamination. *Chemicals*: The water in the water walled storage will be drained during deactivation. *Lead & Other Heavy Metals*: There is lead shielding on the can storage positions in Room 448. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $>10^6$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM
54	**ROOM SET - Rooms 153, 154 (RCRA Unit 776.1), 154B, 155, and 161B** *Asbestos*: The insulation on the condensate tank will be manages as asbestos waste unless sample results indicate the insulation is non-asbestos. *Beryllium*: Pits with Be parts were processes in the autoclaves in Room 153 during the 1960s. *Chemicals*: There are lead acid batteries and tubes of adhesive that will be removed during deactivation. The tanks and vacuum pumps will be drained during deactivation. *Lead & Other Heavy Metals*: Printed circuit boards contain lead. The room thermostat may contain mercury. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The SNM processed in the autoclaves was self-contained; therefore, holdup is not possible in the autoclave pit. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^3 - $>10^4$ cpm) in Room 153 and $>10^6$ cpm in other rooms in this SET.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/dispose of fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
55	**EQUIPMENT SET - Tanks SRV3 (RCRA Unit 94.001), SRV4 (RCRA Unit 94.002), SRV5 (RCRA Unit 94.003), and GB0001** *Beryllium*: Be contaminated metal may have been cleaned in the SRV. This possible Be contamination is not a safety concern due to the suspension in water and the controls necessary for radiological contamination. *Chemicals*: Any liquids in the tanks will be drained during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the filter GB. Lead from the leaded glove washing (ball mill) is assumed to be present in the water within the tanks. The paint on the tanks and filter GBs may contain lead or other RCRA heavy metals. *PCBs*: PCBs may be present in paint. *SNM Holdup*: The tanks were scanned for Pu holdup in the early 1990s. The maximum holdup in any of the tanks is about 200 grams. The tanks will be rescanned for holdup prior to and after the raschig rings are removed. *Radiological Contamination*: The highest fixed contamination marked on the equipment exterior is 100,000 dpm. It is assumed that the inside surface of the tanks is contaminated with $>10^6$ dpm. The tanks were brought to the building for the 1969 fire cleanup; therefore, the tanks were not contaminated by the fire.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM
56	**ROOM SET - Rooms 161 and 161A** *Beryllium*: Surface surveys will be performed prior to decommissioning activities. *Chemicals*: There is a container of Molykote and vacuum grease in Room 161. These chemicals and any liquid in the press will be drained during deactivation. *Lead & Other Heavy Metals*: Paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The press will be scanned for holdup prior to dismantlement to comply with the criticality control requirements for the waste boxes. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $>10^6$ cpm). There is contamination above the paint in Room 161A. There is 10,000 dpm contamination on the console in Room 161A. The electrical boxes are marked with internal contamination warnings.	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Close subsurface volumes	*Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
57	**ROOM SET - Rooms 156, 159 (RCRA Unit 776.1), 159A, 159B, 159C, and 160 (the enclosed portion of Dock 5)** *Asbestos*: The insulation in the furnaces will be managed as asbestos unless sample results or manufacturer information indicate the insulation is non-asbestos. *Chemicals*: Acids, metals, and organics were used in the processes that were in this area. The hood exhaust and furnaces may be contaminated with residual metals from the coating material. *Lead & Other Heavy Metals*: There is lead brick in Room 156. The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. Thermostats may contain mercury. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^3 - 10^5$ cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*SNM Holdup Measurement* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM
58	**ROOM SET - Rooms 157 and 158** *Asbestos*: The tile floor in Room 157 may contain asbestos. *Beryllium*: There is no record of Be storage or processing in this area. Surface surveys will be performed prior to initiating decommissioning to confirm that there is no Be contamination in this area. *Chemicals*: The paint in the flammable cabinet, refrigerant in the air conditioner, Varsol, and oil will be removed prior to decommissioning. *Lead & Other Heavy Metals*: There are lead sheets, bricks, and tape in this set. Thermostats may contain mercury. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: A nitrogen cylinder is marked as having fixed contamination. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $10^4 - 10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
59	**ROOM SET - Rooms 002, 138, 139, 144, and 147; room south of Room 144; and tunnel to Building 771** *Asbestos*: The insulation in Room 144 will be managed as asbestos waste unless sample results indicate that the insulation is non-asbestos. *Chemicals*: The oil in the vacuum pump will be drained during deactivation. The hydraulic oil for the elevator will not be drained until the elevator is removed from service. If the portable tank contains any liquid, the liquid will be removed during deactivation. *Lead & Other Heavy Metals*: There are lead aprons in the SET. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: The portable tank is marked as having 15,000 dpm fixed contamination. The baler and elevator shaft are internally contaminated with Pu. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor levels are the same as those after the 1969 fire (i.e., $10^5 - 10^6$ cpm).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals* *Radiological Surveys*	High levels of radiological contamination	High levels of radiological contamination	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
60	**ROOM/EQUIPMENT SET - Room 146, including Ball Mill Washer (RCRA Unit 94.009), Collection Pan (RCRA Unit 94.010), and Annular Tank (RCRA Unit 94.011), plus Rooms 146A, 146B, and 146C, including SRV Treatment and Storage Units (RCRA Unit 61)** *Asbestos*: There is no insulation, floor tile or fire blankets visible on the 1989 photographs of the vault interior. An updated visual characterization is needed to see if any insulation waste has been placed in the vault since the photographs were taken. *Beryllium*: Be contaminated metal may have been sized reduced in the SRV. *Chemicals*: The oil in the equipment and any residual liquid in the ball mill collection ring or piping will be drained prior to decommissioning. A supplied air entry of the SRV is needed to determine if any containerized chemicals exist. *Lead & Other Heavy Metals*: There is lead shielding on the east side of the vault. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead. These lights will be managed as RCRA hazardous waste. *PCBs*: No PCB items are visible on the 1989 photographs of the area. A visual inspection is needed to determine if PCB ballasts are stored in the vault. PCBs may be present in paint. *SNM Holdup*: Not yet determined. The wash table and ball mill need to be scanned for SNM holdup. The scans will be performed in FY99 and FY00. *Radiological Contamination*: The SRV is expected to be contaminated $>10^6$ dpm Pu on the inner surfaces. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $>10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
61	**ROOM/EQUIPMENT SET - Room 135, FBI Pilot Unit, including Tanks T-1 & T-2 (RCRA Unit 49.02)** *Asbestos*: Insulation on the equipment will be managed as asbestos waste unless sample results indicate that the insulation is nonasbestos. *Chemicals*: The ALARA paint and other containerized chemicals will be removed during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the canyon wall. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. Though PCBs were incinerated in the FBI, the ash is not Toxic Substance Control Act (TSCA) Regulated. *Radiological Contamination*: The FBI is internally contaminated with Pu. The GBs are expected to be contaminated $>10^6$ dpm Pu on the inner surfaces. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - $>10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose of specified constituents	*Radiological Surveys*	High levels of radiological contamination	High levels of radiological contamination	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
62	**ROOM/EQUIPMENT SET - Tanks FBI-1 & FBI-2, and Oil Storage Tanks T-1 & T-2 (RCRA Units 44.01 & 44.02), and Associated Room** *Beryllium*: No process data for Be is available. In process surveys/sampling are needed. *Chemicals*: Organic liquids were stored in these tanks. The liquids were drained in 1998. *Lead & Other Heavy Metals*: Based on the 1992 analysis of liquid from the tank that leaked on the floor, cadmium and chromium are present in the oil. *Radiological Contamination*: The rings in one of the tanks were found to be contaminated (about 10,000 cpm) when they were removed in 1998.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Lead & Other Heavy Metals* Oil *SNM Holdup Measurement* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLM
63	**ROOM/EQUIPMENT SET - Rooms 118, 118A, 118B, 118C, 118D, 118E, 118F, 118G, 118H, and FBI Production Unit (RCRA Unit 49.01)** *Asbestos*: Insulation on equipment will be managed as asbestos unless sample results indicate the insulation is non-asbestos. *Beryllium*: There is no record of Be storage or processing in this area. Surface surveys will be performed prior to initiating decommissioning activities to confirm there is no Be contamination in the area. *Chemicals*: hydraulic oil will be drained from tanks during deactivation. Hydraulic oil for the elevator will not be drained until the elevator is removed from service. If portable tank contains liquid, it will be removed during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the canyon wall. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: The FBI is internally contaminated with low levels of Pu contamination. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor levels are the same as those after the 1969 fire (i.e., >106 cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose of specified constituents	*Beryllium* *Chemicals* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
64	**GLOVEBOX SET - SARF (GBs 512, 513, 515, 517, 518, 521-1, 521-2), including RCRA Unit 74** *Chemicals*: The hydraulic oil will be drained during deactivation. If the collection ring contains any liquid, the liquid will be drained during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the SARF GBs. The fluorescent lights contain mercury, and will be managed as RCRA hazardous waste. Representative samples of the paint throughout the building will be analyzed prior to removal of the paint or painted item. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The potential for holdup in these GBs is extremely low since the GBs were used for a short period of time on material that was well contained. However, these GBs will need to be scanned for SNM holdup prior to removal based on the current criticality limit requirements. *Radioisotope sources*: The Pu sources for alpha mets need to be removed. *Radiological Contamination*: The internal surfaces of the SARF are Pu contaminated. The level of contamination is not known at this time and will need to be determined by in-process surveys. Since the SARF was used for only a short time on TRU waste, the contamination may be lower than in other GBs within the building. Based on discussions with two of the operators, the heaviest contamination should be on the pre-compactor ram and supercompactor piston.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM
65	**ROOM SET - Rooms 127J, 136, 141, 150, and 150A** *Asbestos*: The insulation on the equipment will be managed as asbestos waste unless sample results indicate that the insulation is non-asbestos. *Chemicals*: There are a number of chemicals in this SET, including antifreeze, oil, and freon refrigerant. These chemicals will be in use until the utility equipment is no longer needed. Any containers of chemicals will be removed prior to decommissioning. In addition, the liquid reservoirs on the utility equipment will be drained. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^4 - > 10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Remove/dispose of loose hazardous materials Decommissioning: Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
66	**ROOM/EQUIPMENT SET - ASRF (RCRA Units 776.1 and 776.3), including RDA, MDA, TA, J177, J176, J340, J341, J357, J270, Rooms 130, 130A, 209, 228 and Filter Units, Tank T-344 (RCRA Unit 94.005) and Tank T-345 (RCRA Unit 94.006)** *Asbestos*: There is insulation on the steam piping within Room 228. There are high-temperature mittens within GB J-341. *Beryllium*: Be contaminated metal may have been size reduced in the ASRF. *Chemicals*: The oil in the equipment and any residual condensate in the steam condensate tanks or piping will be drained during deactivation. The containers of liquid in the GBs and the DOP in Room 228 will be removed during deactivation. *Lead & Other Heavy Metals*: There are leaded gloves on the GBs. The paint on the floor and walls may contain lead or other RCRA heavy metals. Incandescent lights contain lead and fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *SNM Holdup*: The GBs in this SET will be scanned for SNM Holdup in FY99 and FY00. *Radioactive Sources*: There are several Pu sources in the ASRF. The sources will be removed when this SET is deactivated. *Radiological Contamination*: The internal surfaces of the ASRF are contaminated. The GBs and the canyons are expected to be contaminated >10^6 dpm Pu on the inner surfaces. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^5 - 10^6 cpm for Rooms 130, 130A, 209 and 228).	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	TRU, TRM, LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
67	**ROOM SET - Rooms 123, 134 (RCRA Unit 776.1), and 137** *Beryllium*: Be parts were moved through this SET on carts. There is no indication that the rooms became contaminated from these parts. Surface surveys will be performed prior to initiating decommissioning activities to confirm there is no Be contamination in this area. *Chemicals*: Any liquids in equipment will be drained during deactivation. The gas cylinders associated with the PCMs will not be removed until the PCMs are no longer needed. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., $>10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM
68	**ROOM SET - Rooms 001 (RCRA Unit 90.99), 127 (RCRA Unit 776.1), 127A, and 127B** *Lead and Other Heavy Metals*: The fence around the process waste tanks has 1/8 inch lead shielding. Representative samples of paint from the rooms will be taken if necessary. Fluorescent lights may contain mercury.. *PCBs*: Ballastss within fluorescent light fixtures may contain PCBs. Paint may be sampled for PCBs. *Radiological*: The map of floor contamination levels after the fire indicates contamination $>10^6$ cpm. The paint on the floor has bubbled several times; surveys completed for radiological contamination verify the contamination levels after the fire.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW, LLM, TRU

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
69	**TANK SET - Tanks T-1A, T1B, T-2A, & T-2B (RCRA Unit 776.2), Tank T3, and Bermed Area** *Beryllium*: Be contaminated metal may have been cleaned in the SRV. Wash water from the SRV was shipped to Tanks T1A and T1B. The process waste from Building 779 may have contained small amounts of Be. This possible Be contamination is not a safety concern due to the suspension in water and the controls necessary for the radiological contamination. *Chemicals*: Any liquids in the tanks or piping will be drained prior to the removal of the piping. The process waste tanks are RCRA regulated. *Lead & Other Heavy Metals*: The tanks were permitted for RCRA heavy metals. *PCBs*: PCBs may be present in paint. *SNM Holdup*: The process waste tanks are limited to fissile exempt liquid by the Nuclear Materials Safety limits. Tank T-3 may be more contaminated inside since the water from the plenums is not necessarily fissile exempt liquid. *Radiological Contamination*: The process waste tanks are limited to fissile exempt liquid by the Nuclear Material Safety Limits. Tank T-3 may be more contaminated inside since the water from the plenums is not necessarily fissile exempt liquid. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor levels are the same as those after the 1969 fire (i.e., $>10^6$ cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/ conduit Package to waste acceptance criteria	*Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	High levels of radiological contamination	High levels of radiological contamination	LLW, TRU
70	**ROOM SET - Rooms 205, 206, 208 (RCRA Units 776.1 & 777.1), 219, 237 (RCRA Unit 776.1), and 232 to 256 (not all inclusive)** *Asbestos*: Floor tiles and pipe insulation in several rooms may contain asbestos. *Beryllium*: Be was not stored or processed on the second floor of Building 776 or 777B. Be was handled on the first floor of the Building 777B. In process surveys for Be contamination will be needed when building components are removed. The only potential site of Be contamination on the second floor of Building 776 is the exhaust ducting and plenums. Surface surveys will be performed prior to initiating decommissioning activities. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. Fluorescent light fixtures contain mercury. These lights will be managed as RCRA hazardous waste. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. *Radiological Contamination*: The GBs are expected to be contaminated $>10^6$ dpm Pu on the inner surfaces. The maximum fixed contamination on the exterior of the GBs is 600,000 dpm. There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^3 - 10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
71	**EQUIPMENT SET - Superdry Air Drying System, 2nd Floor** *Asbestos*: The insulation on the ducting contains asbestos. *Beryllium*: Be was stored, cleaned, and assembled in the Superdry facility. None of these operations would cause significant airborne contamination. Surface surveys will be performed prior to initiating decommissioning activities. *Chemicals*: The dryers are filled with silica gel. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. *PCBs*: PCBs may be present in paint. *Radiological Contamination*: The dryers may be slightly contaminated from room exhaust.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW
72	**EQUIPMENT SET - GB Dry Air Drying System, 2nd Floor** *Asbestos*: The insulation on the Kathabar K-1 is listed in the asbestos inventory. Insulation on the remaining units will be managed as asbestos. *Beryllium*: The only potential site of Be contamination on the second floor is the exhaust plenums. Surface surveys will be performed prior to initiating decommissioning activities. *Chemicals*: Any freon refrigerant remaining in the compressors will be removed during deactivation. *Lead & Other Heavy Metals*: Kathene sludge has been analyzed and shown to contain regulated amounts of cadmium, chromium and lead. *PCBs*: The lubricating oil in the Kathabars will be tested for PCBs since the unit is pre1970s and the oil has not been changed since the 1960s. PCBs may be present in paint. *SNM Holdup*: GB exhaust was not routed through this unit during its operation. The contamination in the unit is from the makeup air drawn form the 2nd floor during the 1969 fire. *Radiological Contamination*: The GBDA Cathedra is known to be internally contaminated from the 1969 fire.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Lead & Other Heavy Metals:* Sludge *SNM Holdup Measurement*	Beryllium	PPE CBDPP	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
73	**EQUIPMENT SET - Remainder of the 2nd Floor Equipment Not in Other SETS** *Asbestos*: Asbestos has been detected in multiple insulation samples on the 2nd floor. The insulation on the piping and equipment in this SET will be managed as asbestos contaminated waste. *Beryllium*: The only potential site of Be contamination on the second floor is in the exhaust plenums. Surveys will be performed prior to initiating decommissioning activities. *Chemicals*: Any liquids or compressed gases will be drained from the equipment prior to removing the equipment. This includes brine, freon, oil and water. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals *PCBs*: PCBs may be present in paint. *Radiological Contamination*: The reheat system is known to be internally contaminated. The remaining equipment may be contaminated since the SET is contained within a Radiation Buffer Area (RBA). Unless the equipment is unpainted and 100% surveyable, the equipment will be disposed of as LLW.	Deactivation: Remove/package classified material Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW
74	**BUILDING STRUCTURE SET - Building 702, 712 and 712A** *Asbestos*: The insulation on the steam lines in Building 702 will be managed as asbestos waste unless sampling indicates otherwise. The baffles on the cooling tower will be sampled for asbestos. *Chemicals*: There are several drums of oil that will be removed from Building 702 during deactivation. Liquids from the motors, pumps, and piping will be drained also. *Lead & Other Heavy Metals*: Incandescent lights contain lead. Fluorescent light fixtures and mercoid switches contain mercury. These items will be managed as RCRA hazardous waste. *Radiological Contamination*: There is no indication of radiological contamination in these buildings. Surveys will be performed to verify contamination is not present.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose of specified constituents Remove/dispose of structures Close subsurface volumes	*Asbestos* *Chemicals* *Radiological Surveys*	None	PPE	HAZ, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
75	**BUILDING STRUCTURE SET - Building 781** *Beryllium*: Not yet known; there is no process history for the items tested in the chamber in Building 781. *Chemicals*: A cylinder of helium in the building will be removed prior to decommissioning. *Lead & Other Heavy Metals*: Incandescent lights contain. These lights will be managed as RCRA hazardous waste. *Radiological Contamination*: There is no indication of radiological contamination in this building. However, the compressor lines from Building 781 pass into a Contamination Area in Room 459A, Building 777. Surveys will be performed to verify contamination is not present.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose specified constituents Close subsurface volumes	*Beryllium* *Radiological Surveys*	None	PPE	LLW, LLM
76	**BUILDING STRUCTURE SET - Building 701, 710 and 730** *Asbestos*: The insulation in these buildings will be managed as asbestos waste unless sampling indicates otherwise. *Beryllium*: There may be historical Be contamination from the laundry water in Building 730. There is no indication of Be handing or storage in Building 701 or 710. *Chemicals*: There are several gas cylinders that will be removed from Building 701 during deactivation. Liquids from the motors, pumps and piping will be drained also. *Lead & Other Heavy Metals*: Incandescent lights contain lead, fluorescent light fixtures contain mercury, and sodium vapor lights can contain lead and mercury. These lights will be managed as RCRA hazardous waste. There are leaded gloves stored in this SET. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed *Radiological Contamination*: The liquids handled in Building 730 were radioactively contaminated. Building 701 has been contaminated twice by incidents related to process waste backing up into a toilet in 1972 and personnel spreading contamination from Building 730 in 1975. The building was decontaminated after both incidents. There is no indication of radiological contamination in Building 710.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose of specified constituents Remove/dispose of structures Close subsurface volumes	*Beryllium* *Chemicals* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, HAZ, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
77	**EQUIPMENT SET - Chillers #2 and #3 (not in use) in Room 150** *Asbestos*: Asbestos has been detected in samples of the Chiller #5 insulation. Based on this information and the age of Chillers #2 and #3, it is assumed that the insulation on these chillers contains asbestos. *Chemicals*: Any brine or oil remaining in the chillers will be drained prior to removal of the chillers. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. *PCBs*: A PCB determination of ballasts will be made when the ballasts are removed. PCBs may be present in paint. Radiological Contamination: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., 10^4 ->10^6 cpm).	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Chemicals* *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	LLW
78	**EQUIPMENT SET - Miscellaneous Unused Piping (e.g. machine coolant, CCl_4, trichloroethane, process waste, and argon)** *Beryllium*: The possibility of Be contamination exists in the waste lines (process, machine coolant and trichloroethane). This possible Be contamination is not a safety concern due to the suspension in oil and the controls necessary for the radiological contamination. Be contamination is expected in the argon system as well. *Chemicals*: Sections of piping will be drained prior to removal of the pipe. The liquids will be characterized according to the individual system (i.e., process waste, trichloroethane, and machine coolant). *SNM Holdup*: The piping will be scanned prior to disposal to comply with current criticality limit requirements. It is anticipated the holdup amounts will be modest if any for the waste lines. The amounts in the argon system may be higher than the other systems in this SET if the argon was not filtered prior to leaving the GB. *Radiological Contamination*: Based on the removal of waste trichloroethane and machine coolant lines in 1995 and 1998, the interior of this piping is contaminated >10^6 dpm. The painted supply piping may be contaminated on the exterior. The process waste piping will be contaminated to varying degrees depending on the source of the liquid (i.e., the line for size reduction will be more contaminated than the lines from the ASRF or the 2nd floor). The argon line in Room 475 is assumed to be contaminated with >10^6 dpm Pu since these units contained GB atmosphere.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
79	**EQUIPMENT SET - Criticality Accident Alarm System (CAAS) and Plenum Deluge System** *Beryllium*: There is no indication of Be contamination on the components of this SET that will be removed during decommissioning. Be surveys will be required to "free release" the system component. *Chemicals*: The water from the deluge valve to the supply will need to be drained. The system is "dry" within the plenum. *Radiological Contamination*: Radiological contamination is not encountered when the neutron detectors are replaced or serviced.	Deactivation: Drain/dispose of solutions Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *Chemicals* *Radiological Surveys*	None	PPE	LLW, SAN
80	**EQUIPMENT SET - Plenums and associated ductwork for Zone 1 ventilation** *Beryllium*: The ducting from the GBs and hoods that processed Be will be considered Be contaminated. *Chemicals*: DOP on the filters from testing. *SNM Holdup*: The plenums are scanned on an annual basis to determine the amount of holdup present. The ducting was scanned in 1990 to determine the amount of SNM within the ducting. SNM has been removed from the molten salts duct. SNM holdup will be reduced to the safeguards termination limits during deactivation. *Radiological Contamination*: The plenums are High Contamination Areas. The plenums and ducting contain gram amounts of Pu and are therefore contaminated in excess of 10^6 dpm.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Control radioactive/chemical contamination Drain/isolate/remove/dispose utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Beryllium* *SNM Holdup Measurement* *Radiological Surveys*	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, TRU

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
81	**EQUIPMENT SET - Miscellaneous external items (including UST, AST, cargo containers, exterior piping, and electrical transformers)** *Asbestos*: Much of the steam condensate line insulation has been replaced with non-asbestos insulation. Any insulation that has not been replaced or installed recently will be managed as asbestos unless sample results indicate the insulation is non-asbestos. *Beryllium*: The process waste lines may have low levels of Be contamination (see tank SETs 7, 26 and 69). This possible Be contamination is not a safety concern due to the suspension in liquid and the controls that are necessary for radiological contamination. *Chemicals*: There are chemical containers that will be removed from cargo containers during deactivation. Any residual liquids in the piping will be removed prior to decommissioning. The dielectric fluid in the transformers will be sampled and removed prior to removal of the transformer carcasses. *Lead & Other Heavy Metals*: Sodium vapor lights contain lead and mercury. There are treatability wastes in cargo containers that must be disposed of prior to decommissioning. *SNM Holdup*: Not determined. The contaminated piping was used to ship process waste. Based on the removal of the trichloroethane piping in Rooms 141 and 430, there is no detectable holdup in the piping. The piping will require scanning prior to packaging to comply with the current criticality controls for waste drums and boxes. *Radiological Contamination*: The process waste lines are internally contaminated. The other piping should not be contaminated. The cargo carriers, their contents, and the transformer carcasses will be surveyed for "free release" also.	<u>Deactivation</u>: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Remove/dispose of loose hazardous materials <u>Decommissioning</u>: Control radioactive/chemical contamination Drain/isolate utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria	*Asbestos* *Beryllium* *Chemicals* *Lead & Other Heavy Metals:* Sludge *SNM Holdup Measurement* *Radiological Surveys*	Beryllium	PPE CBDPP	LLW, LLM, HAZ, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
82	**BUILDING STRUCTURE SET - Building Shell (1st and 2nd Floors) includes Docks 2 through 6** *Asbestos*: The walls contain several asbestos features. Much of the original exterior walls are covered with transite panels. Where asbestos insulated pipes pass through the 2nd floor, asbestos insulation may be present in the pipe section remaining in the floor. The mortar filling contained in some cement blocks might contain asbestos. *Beryllium*: Be surveys will be needed for the building structure once the equipment is removed. The areas that have known or suspected contamination can be found on the Be map in the Reconnaissance Level Characterization Report or in the individual SET descriptions in this appendix. *Chemicals*: The wall along column line L between Columns 7 and 9 is potentially contaminated with carbon tetrachloride and oil. In the 1960s prior to the 1969 fire, waste machine coolant mixed with carbon tetrachloride was sprayed onto the wall when drums of the liquid were overfilled. There are numerous other incidents where the same waste leaked onto the 1st floor in other areas of the building. Since the 1st floor will not be removed during decommissioning, these sites do not affect characterization of the waste generated during decommissioning. *Lead & Other Heavy Metals*: The paint on the floor and walls may contain lead or other RCRA heavy metals. The concrete near the Kathabar units on the second floor is contaminated with Kathene. Kathene sludge contains chromium, cadmium and lead. The levels of these metals in the concrete have not been determined. Based on comments from a former NDT employee, the north, west, and east walls of Room 473 may contain lead "wool" within the concrete. The lead was added to increase the shielding provided by the walls. *Radiological Contamination*: There is fixed contamination beneath the paint on the floor and building walls from the 1969 fire. It is assumed that the floor contamination levels are the same as those after the 1969 fire (i.e., a range of not detectable to $>10^6$ cpm).	Ensure that the following deactivation and decommissioning have been completed: Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Remove/dispose of loose hazardous materials Decommissioning: Drain/isolate fluid systems Control radioactive/ chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose of specified constituents Control air emissions Then: Remove/dispose of building structure	*Beryllium* *Lead & Other Heavy Metals:* Sludge *Radiological Surveys*	Beryllium High levels of radiological contamination Kathene	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, TRU, LLM, HAZ, SAN

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
83	**EQUIPMENT SET - SET 83 is broken into three parts: (1) Buildings 703, 713 (cooling tower) and 713A, (2) Zone 2 Plenums and Ductwork, (3) Remaining equipment in Building776/777 (Supply Fans S1 –S9, HP heads, air, N_2, sanitary drains, domestic water, electrical, UPS batteries (Room 230), LS/DW batteries, Rooms 230A, 231, 231A and 232A, fire systems). The overall SET has the same endpoints; the individual parts have different hazards and contaminants, as shown below.** *Asbestos*: (1) The insulation on the piping and structure will be managed as asbestos waste unless sampling indicates otherwise. The baffles on the cooling tower may contain asbestos. (2) None. (3) The pipe insulation, ceiling tile and floor tile will be managed as asbestos waste unless sampling indicates otherwise. *Beryllium*: (1) None. (2) The ducting from the rooms with Be was handled will be considered Be contaminated. (3) None. *Chemicals*: (1) There are containers of oil and Nalco 2826 that will be removed from Building 702 during deactivation. Liquids from the motors, pumps and piping will be drained also. (2) There is DOP on the filters from testing. (3) The electrolyte in the batteries is acidic. *Lead & Other Heavy Metals*: (1) The fluorescent bulbs contain mercury (Building 703) and will be managed as hazardous waste. (2) None (3) The fluorescent bulbs contain mercury. There is lead within the LS/DW and UPS batteries. Incandescent bulbs can contain lead. *PCBs*: (1) A PCB determination of ballasts will be made when the ballasts are removed. (2) None (3) A PCB determination of ballasts will be made when the ballasts are removed. The switchgear will be inspected for PCB capacitors when it is deactivated. *Radioactive Sources*: (1) None (2) None (3) The sources in the air monitors will be removed with the air monitors. *Radiological Contamination*: (1) There is no indication of radiological contamination in these buildings. (2) The plenums are High Contamination Areas. Several room exhaust ducts on the 1st floor are marked "contains fixed contamination". (3) The remaining equipment may be contaminated since the SET is contained within a Radiation Buffer Area and Contamination Area. Unless the equipment is unpainted and 100% surveyable, the equipment will be disposed of as LLW.	Deactivation: Remove/dispose of loose combustibles Drain/dispose of solutions Remove/dispose of loose equipment Control/fix contamination Decommissioning: Drain/isolate fluid systems Control radioactive/chemical contamination Drain/isolate/remove/dispose of utility systems Remove/dispose of equipment & associated piping/conduit Package to waste acceptance criteria Remove/dispose specified constituents Control air emissions Remove/dispose of structures Close subsurface volumes	*Beryllium* (2) *Chemicals* (1), (3) *PCBs* (3) *Radiological Surveys* (1), (2), (3)	Beryllium High levels of radiological contamination	PPE CBDPP Radiological Controls/ ALARA Principles	LLW, LLM

SET NO.	SET DESCRIPTION	MAJOR ENDPOINTS	ADDITIONAL CHARACTERIZTION NEEDED	UNIQUE HAZARD ANALYSIS	HAZARD CONTROL	WASTE STREAM
84	**EQUIPMENT SET - Floors and below-grade features filled with concrete, including equipment from the 1969 fire cleanup** *Asbestos:* It is assumed that the insulation on the buried autoclave contains asbestos. *Chemicals:* There were numerous incidents in Rooms 127, 131, and 134E where oil/carbon tetrachloride mixture leaked to the floor. This mixture was cleaned in accordance with decontamination practices or procedures in place at the time of the spill. The stairwells, mill/press pits and the Hydroform equipment room floor were most likely contaminated with this mixture at various times. There is no information on the presence or absence of leakage from the paint trap. Trichloroethylene was used for cleaning items processed in the autoclaves. *Lead & Other Heavy Metals:* The paint on the floor and walls may contain lead or other RCRA heavy metals. *SNM Holdup:* Not yet determined. Buried equipment used to process SNM (GBs, rolling mill rolls) may contain SNM. *Radiological:* The depth of the contamination into the floor has not been established. The contaminated fire water from the 1969 fire may have penetrated the floors at the expansion joints.	Decommissioning: Area A, Stairwells (5) Under Main Floor Slab Control radioactive contamination Remove/ dispose of cement Package to waste acceptance criteria Control air emissions Area B, Room 127, Maintenance Area Control radioactive contamination Remove/ dispose of cement and metal panels Package to waste acceptance criteria Control air emissions Area C, Four-High Rolling Mill Pit Control radioactive contamination Remove/ dispose of cement and equipment Package to waste acceptance criteria Control air emissions Area D, Marform Press Pit Control radioactive contamination Remove/dispose of cement Package to waste acceptance criteria Control air emissions Area E, Hydroform Press Room Control radioactive contamination Remove/dispose of cement and equipment Package to waste acceptance criteria Control air emissions Area F, Autoclave Equipment Pit Control radioactive contamination Remove/ dispose of cement Package to waste acceptance criteria Control air emissions Area G, Washing Machine Drain Pit Control radioactive contamination Remove/dispose of cement and equipment Package to waste acceptance criteria Control air emissions Area H, Paint Trap Control radioactive contamination Remove/dispose of cement and equipment Package to waste acceptance criteria Control air emissions	*Chemicals:* To be determined. *SNM Holdup:* To be determined on a case by case basis. *Radiological Surveys*	High levels of radiological contamination	PPE Radiological Controls/ ALARA Principles	TRU, TRM, LLW

This page has been left intentionally blank due to classification issues. Personnel with access to UCNI may obtain this information from the Building 776/777 Closure Project Director.

Figure contained in Attachment

Appendix B

Figure B-1
Building 776/777 First Floor SET Locations

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Figure contained in Attachment

Appendix B

Figure B-2
Building 776/777 Second Floor SET Locations

Appendix C
Ground Water Action Levels
(source: RFCA, Attachment 5)

Analyte	CAS No.	Tier 1- 100 x MCLs (mg/L)	Tier 2- MCLs (mg/L)
Acenaphthene (V)	83-32-9	*2.19E+02*	*2.19E+00*
Acetone (V)	67-64-1	*3.65E+02*	*3.65E+00*
Aldrin	309-00-2	*5.00E-04*	*5.00E-06*
Aluminum	7429-90-5	*1.06E+04*	*1.06E+02*
Anthracene (V)	120-12-7	*1.10E+03*	*1.10E+01*
Antimony	7440-36-0	6.00E-01	6.00E-03
Aroclor-1016	12674-11-2	5.00E-02	5.00E-04
Aroclor-1221	11104-28-2	5.00E-02	5.00E-04
Aroclor-1232	11141-16-5	5.00E-02	5.00E-04
Aroclor-1242	53469-21-9	5.00E-02	5.00E-04
Aroclor-1248	12672-29-6	5.00E-02	5.00E-04
Aroclor-1254	11097-69-1	5.00E-02	5.00E-04
Aroclor-1260	11096-82-5	5.00E-02	5.00E-04
Arsenic	7440-38-2	5.00E+00	5.00E-02
Barium	7440-39-3	2.00E+02	2.00E+00
Benzene (V)	71-43-2	5.00E-01	5.00E-03
alpha-BHC	319-84-6	*1.35E-03*	*1.35E-05*
beta-BHC	319-85-7	*4.72E-03*	*4.72E-05*
gamma-BHC (Lindane)	58-89-9	2.00E-02	2.00E-04
Benzo(a)anthracene	56-55-3	*1.16E-02*	*1.16E-04*
Benzo(a)pyrene	50-32-8	2.00E-02	2.00E-04
Benzo(b)fluoranthene	205-99-2	*1.16E-02*	*1.16E-04*
Benzo(k)fluoranthene	207-08-9	*1.16E-01*	*1.16E-03*
Benzoic Acid	65-85-0	*1.46E+04*	*1.46E+02*
Benzyl Alcohol	100-51-6	*1.10E+03*	*1.10E+01*
Beryllium	7440-41-7	4.00E-01	4.00E-03
bis(2-Chloroethyl)ether (V)	111-44-4	*1.63E-03*	*1.63E-05*
bis(2-Chloroisopropyl)ether (V)	108-60-1	*4.22E-02*	*4.22E-04*
bis(2-Ethylhexyl)phthalate	117-81-7	6.00E-01	6.00E-03
Bromodichloromethane (V)	75-27-4	1.00E+01	1.00E-01
Bromoform (V)	75-25-2	1.00E+01	1.00E-01
Bromomethane (V)	74-83-9	*1.09E+00*	*1.09E-02*
2-Butanone (V)	78-93-3	*2.47E+02*	*2.47E+00*
Butylbenzylphthalate	85-68-7	*7.30E+02*	*7.30E+00*
Cadmium	7440-43-9	5.00E-01	5.00E-03
Carbon disulfide (V)	75-15-0	*2.76E+00*	*2.76E-02*
Carbon tetrachloride (V)	56-23-5	5.00E-01	5.00E-03
alpha-Chlordane	5103-71-9	2.00E-01	2.00E-03
beta-Chlordane	5103-74-2	2.00E-01	2.00E-03
gamma-Chlordane	5103-74-2	2.00E-01	2.00E-03
4-Chloroaniline	106-47-8	*1.46E+01*	*1.46E-01*
Chlorobenzene (V)	108-90-7	1.00E+01	1.00E-01
Chloroethane (V)	75-00-3	*2.78E+03*	*2.78E+01*
Chloroform (V)	67-66-3	1.00E+01	1.00E-01
Chloromethane (V)	74-87-3	*2.32E-01*	*2.32E-03*
2-Chloronaphthalene (V)	91-58-7	*2.92E+02*	*2.92E+00*
2-Chlorophenol (V)	95-57-8	*1.83E+01*	*1.83E-01*
Chromium	7440-47-3	1.00E+01	1.00E-01
Chrysene	218-01-9	*1.16E+00*	*1.16E-02*
Cobalt	7440-48-4	*2.19E+02*	*2.19E+00*

Appendix C
Ground Water Action Levels
(source: RFCA, Attachment 5)

Analyte	CAS No.	Tier 1- 100 x MCLs (mg/L)	Tier 2- MCLs (mg/L)
Copper	7440-50-8	1.30E+02	1.30E+00
Cyanide	57-12-5	2.00E+01	2.00E-01
4,4-DDD	72-54-8	*3.54E-02*	*3.54E-04*
4,4-DDE	72-55-9	*2.50E-02*	*2.50E-04*
4,4-DDT	50-29-3	*2.50E-02*	*2.50E-04*
Dalapon	75-99-0	2.00E+01	2.00E-01
Dibenz(a,h)anthracene	53-70-3	*1.16E-03*	*1.16E-05*
Dibromochloromethane	124-48-1	*1.01E-01*	*1.01E-03*
1,2-Dibromo-3-chloropropane	96-12-8	2.00E-02	2.00E-04
Di-n-butylphthalate	84-74-0	*3.65E+02*	*3.65E+00*
2,4-D	94-75-7	7.00E+00	7.00E-02
1,2-Dichlorobenzene (V)	95-50-1	6.00E+01	6.00E-01
1,3-Dichlorobenzene (V)	541-73-1	6.00E+01	6.00E-01
1,4-Dichlorobenzene (V)	106-46-7	7.50E+00	7.50E-02
3,3-Dichlorobenzidine	91-94-1	*1.89E-02*	*1.89E-04*
1,1-Dichloroethane (V)	107-06-2	*1.01E+02*	*1.01E+00*
1,2-Dichloroethane (V)	107-06-2	5.00E-01	5.00E-03
1,1-Dichloroethene (V)	540-59-0	7.00E-01	7.00E-03
1,2-Dichloroethene (total)(V)	540-59-0	7.00E+00	7.00E-02
2,4-Dichlorophenol	120-83-2	*1.10E+01*	*1.10E-01*
1,2-Dichloropropane (V)	78-87-5	5.00E-01	5.00E-03
cis-1,3-Dichloropropene (V)	1006-01-5	*1.27E-02*	*1.27E-04*
trans-1,3-Dichloropropene (V)	10061-02-6	*1.27E-02*	*1.27E-04*
Dieldrin	60-57-1	*5.31E-04*	*5.31E-06*
Diethylphthalate	84-66-2	*2.92E+03*	*2.92E+01*
2,4-Dimethylphenol (V)	105-67-9	*7.30E+01*	*7.30E-01*
Dimethylphthalate	131-11-3	*3.65E+04*	*3.65E+02*
2,4-Dinitrophenol	51-28-5	*7.30E+00*	*7.30E-02*
2,4-Dinitrotoluene	121-14-2	*7.30E+00*	*7.30E-02*
2,6-Dinitrotoluene	606-20-2	*1.25E-02*	*1.25E-04*
Di-n-octylphthalate	117-84-0	*7.30E+01*	*7.30E-01*
Endosulfan I	959-98-8	*2.19E+01*	*2.19E-01*
Endosulfan II	33213-65-9	*2.19E+01*	*2.19E-01*
Endosulfan sulfate	1031-07-8	*2.19E+01*	*2.19E-01*
Endosulfan (technical)	115-29-7	*2.19E+01*	*2.19E-01*
Endrin (technical)	72-26-8	2.00E-01	2.00E-03
Ethylbenzene (V)	100-41-4	7.00E+01	7.00E-01
Fluoranthene	206-44-0	*1.46E+02*	*1.46E+00*
Fluorene (V)	86-73-7	*1.46E+02*	*1.46E+00*
Fluoride	16984-48-8	4.00E+02	4.00E+00
Glyphosate	1071-83-6	7.00E+01	7.00E-01
Heptachlor	76-44-8	4.00E-02	4.00E-04
Heptachlor epoxide	1024-57-3	2.00E-02	2.00E-04
Hexachlorobenzene	118-74-1	1.00E-01	1.00E-03
Hexachlorobutadiene	87-68-3	*1.09E-01*	*1.09E-03*
Hexachlorocyclopentadiene	77-47-4	5.00E+00	5.00E-02
Hexachloroethane	67-72-1	*6.07E-01*	*6.07E-03*
Indeno(1,2,3-cd)pyrene	193-39-5	*1.16E-02*	*1.16E-04*
Isophorone	78-59-1	*8.95E+00*	*8.95E-02*
Lithium	7439-93-2	*7.30E+01*	*7.30E-01*

Appendix C
Ground Water Action Levels
(source: RFCA, Attachment 5)

Analyte	CAS No.	Tier 1- 100 x MCLs (mg/L)	Tier 2- MCLs (mg/L)
Manganese	7439-96-5	***1.83E+01***	***1.83E-01***
Mercury	7439-97-6	2.00E-01	2.00E-03
Methoxychlor	72-43-5	4.00E+00	4.00E-02
Methylene chloride (V)	75-09-2	5.00E-01	5.00E-03
4-Methyl-2-pentanone (V)	108-10-1	***2.03E+01***	***2.03E-01***
2-Methylphenol	95-48-7	***1.83E+02***	***1.83E+00***
Molybdenum	7439-98-7	***1.83E+01***	***1.83E-01***
Naphthalene (V)	91-20-3	***1.46E+02***	***1.46E+00***
Nickel	7440-02-0	1.00E+01	1.00E-01
Nitrate (MCL as N)	1-005	1.00E+03	1.00E+01
Nitrite (MCL as N)	1-005	1.00E+02	1.00E+00
Nitrobenzene (V)	98-95-3	***4.20E-01***	***4.20E-03***
n-Nitrosodiphenylamine (V)	86-30-6	***1.73E+00***	***1.73E-02***
n-Nitrosodipropylamine	621-64-7	***1.21E-03***	***1.21E-05***
Pentachlorophenol	87-86-5	1.00E-01	1.00E-03
Phenol	108-95-2	***2.19E+03***	***2.19E+01***
Pyrene	129-00-0	***1.10E+02***	***1.10E+00***
Selenium	7782-49-2	5.00E+00	5.00E-02
Silver	7440-22-4	***1.83E+01***	***1.83E-01***
Strontium	7440-24-6	***2.19E+03***	***2.19E+01***
Styrene (V)	100-42-5	1.00E+01	1.00E-01
Sulfate	14808-79-8	5.00E+04*	5.00E+02*
1,1,2,2-Tetrachloroethane (V)	79-34-5	***8.95E-03***	***8.95E-05***
Tetrachloroethene (V)	127-18-4	5.00E-01	5.00E-03
Thallium	7440-28-0	2.00E-01	2.00E-03
Tin	7440-31-5	***2.19E+03***	***2.19E+01***
Toluene (V)	108-88-3	1.00E+02	1.00E+00
Toxaphene	8001-35-2	3.00E-01	3.00E-03
1,2,4-Trichlorobenzene (V)	120-82-1	7.00E+00	7.00E-02
1,1,1-Trichloroethane (V)	71-55-6	2.00E+01	2.00E-01
1,1,2-Trichloroethane (V)	79-00-5	5.00E-01	5.00E-03
Trichloroethene (V)	79-01-6	5.00E-01	5.00E-03
2,4,5-Trichlorophenol	95-95-4	5.00E+00	5.00E-02
2,4,6-Trichlorophenol	88-06-2	***7.73E-01***	***7.73E-03***
Vanadium	7440-62-2	***2.56E+01***	***2.56E-01***
Vinyl acetate	108-05-4	***3.65E+03***	***3.65E+01***
Vinyl chloride (V)	75-01-4	2.00E-01	2.00E-03
Xylene (total)(V)	1330-20-7	1.00E+03	1.00E+01
Zinc	7440-66-6	***1.10E+03***	***1.10E+01***

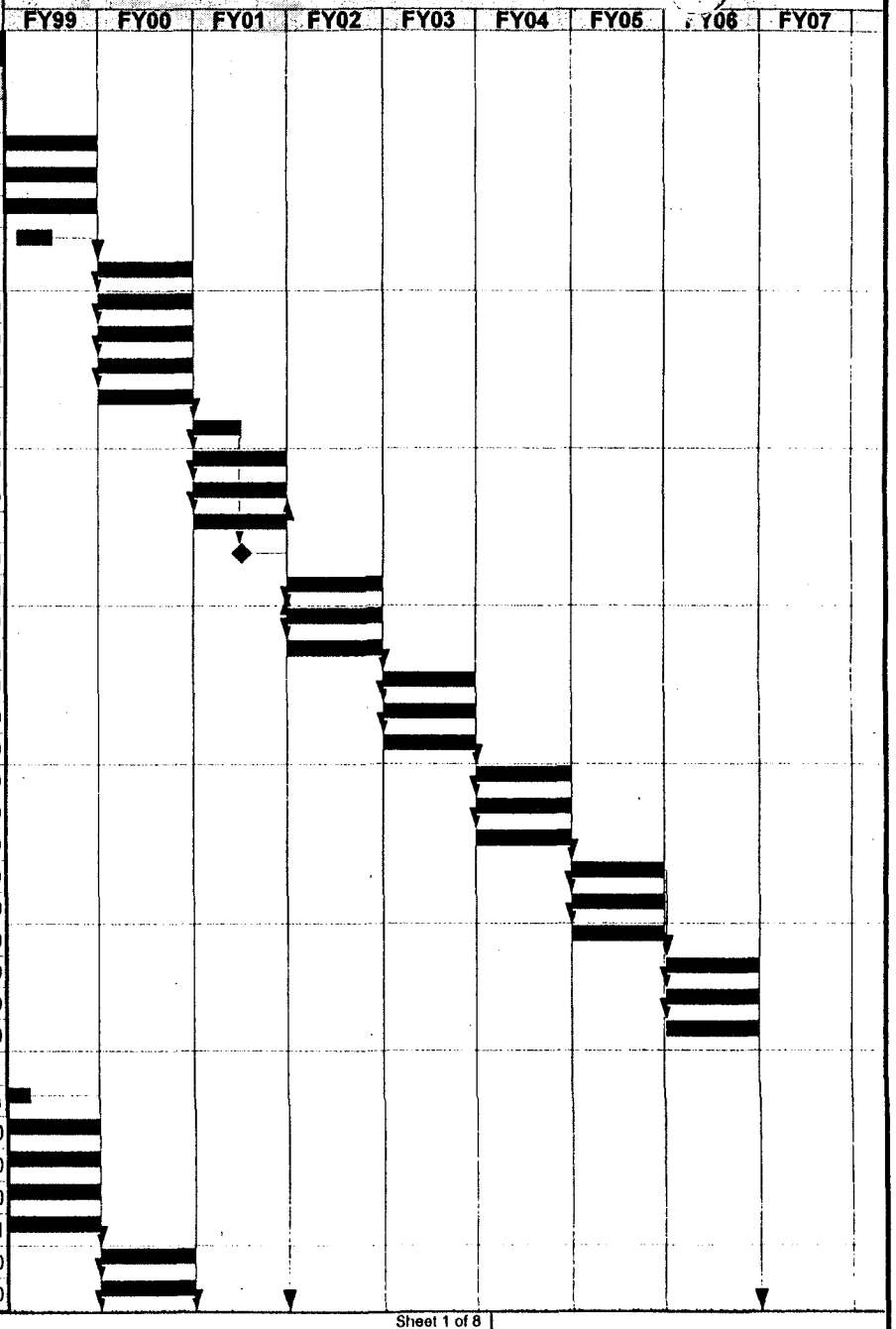
Appendix D
Building 776/777 Closure Project
Administrative Record

DOCUMENT	DRIVER
Administrative Record Listing	RFCA, ¶s 283-285; CERCLA, 40 CFR 300.800 *et seq.*
Joint Scoping Meeting Minutes/Disposition	FDPM, Section 3.3.7.2
Reconnaissance Level Characterization Report (RLCR)	RFCA, ¶120(g)
DRAFT Decommissioning Operations Plan (DOP)	RFCA, ¶107
DOP Responsiveness Summary	RFCA, ¶107
FINAL DOP	RFCA, ¶107
Pre-Demolition Survey	DPP, Sections 3.3.10 and 3.3.13; CERCLA, , 40 CFR 300.800 *et seq.*
Demolition Permit	FDPM, Section 6.3.4
Notification to CDPHE prior to demolition (required for asbestos abatement activities)	DOE Order 440.1, OSHA, 29 CFR 1910 *et seq.*
Air Pollutant Emission Notification (APEN), (required if 2000 lbs. dust/VOC emissions will be exceeded in a single event)	Colorado Air Quality Control Regulation No. 3
Post-Demolition Survey	CERCLA, 40 CFR 300.800 *et seq.*; DDCP,
Decommissioning Final Closeout Report	RFCA, ¶118

Appendix E

Building 776/777 Closure Project Schedule

Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Finish	Total Float
019 PBD 019 - Building 776 / 777 Cluster Closure							
035 WAD 035 - 776 / 777 Cluster Project							
1.1.06.12.01.01 776/777 CLUSTER COMPLIANCE SURVEILLANCE							
D5F0199E00	Compliance Surveillance - Environmental	254	254	0	01OCT98	30SEP99	0
D5F0199M00	Compliance Surveillance - Other	254	254	0	01OCT98	30SEP99	0
D5F0199A00	Compliance Surveillance - Authorization	254	254	0	01OCT98	30SEP99	1
D5F0199M02	Glove Inspection/Changes B776/7 FY-99 20% of TTL	94	94	0	16NOV98*	31MAR99	0
D5F0100E00	Compliance Surveillance - Environmental	254	254	0	01OCT99	29SEP00	0
D5F0100M00	Compliance Surveillance - Other	254	254	0	01OCT99	29SEP00	0
D5F0100M11	FY-99 Accel Cand Glove Inspection/Chgs B776/7	254	254	0	01OCT99	29SEP00	0
D5F0100M12	Glove Inspection/Changes B776/7 FY-00	254	254	0	01OCT99	29SEP00	0
D5F0100A00	Compliance Surveillance - Authorization	254	254	0	01OCT99	29SEP00	1
D5F0101M11	Glove Inspection/Changes B776/7 FY-01	126	126	0	02OCT00	30MAR01	0
D5F0101E00	Compliance Surveillance - Environmental	253	253	0	02OCT00	28SEP01	0
D5F0101M00	Compliance Surveillance - Other	253	253	0	02OCT00	28SEP01	0
D5F0101A00	Compliance Surveillance - Authorization	253	253	0	02OCT00	28SEP01	1
D5F0101MS1	Complete B776/7 Glovebox Inspections/Changes	0	0	0		30MAR01	0
D5J4802A00	D&D Support Service - AB Compliance Surveillance	254	254	0	01OCT01	30SEP02	0
D5J4802E00	D&D Support Service - Environmental Surveillance	254	254	0	01OCT01	30SEP02	0
D5J4802M00	D&D Support Service - Other (Misc.) Surveillance	254	254	0	01OCT01	30SEP02	0
D5J4803A00	D&D Support Service - AB Compliance Surveillance	254	254	0	01OCT02	30SEP03	0
D5J4803E00	D&D Support Service - Environmental Surveillance	254	254	0	01OCT02	30SEP03	0
D5J4803M00	D&D Support Service - Other (Misc.) Surveillance	254	254	0	01OCT02	30SEP03	0
D5J4804A00	D&D Support Service - AB Compliance Surveillance	255	255	0	01OCT03	30SEP04	0
D5J4804E00	D&D Support Service - Environmental Surveillance	255	255	0	01OCT03	30SEP04	0
D5J4804M00	D&D Support Service - Other (Misc.) Surveillance	255	255	0	01OCT03	30SEP04	0
D5J4805A00	D&D Support Service - AB Compliance Surveillance	254	254	0	01OCT04	30SEP05	0
D5J4805E00	D&D Support Service - Environmental Surveillance	254	254	0	01OCT04	30SEP05	0
D5J4805M00	D&D Support Service - Other (Misc.) Surveillance	254	254	0	01OCT04	30SEP05	0
D5J4806A00	D&D Support Service - AB Compliance Surveillance	253	253	0	03OCT05	29SEP06	0
D5J4806E00	D&D Support Service - Environmental Surveillance	253	253	0	03OCT05	29SEP06	0
D5J4806M00	D&D Support Service - Other (Misc.) Surveillance	253	253	0	03OCT05	29SEP06	0
1.1.06.12.01.02 776/777 CLUSTER MAINTENANCE							
D5F0299M05	Pressure Safety JCO (Major IWCP)	63	63	0	01OCT98	31DEC98	1
D5F0299C00	Maintenance - Corrective	254	254	0	01OCT98	30SEP99	0
D5F0299P00	Maintenance - Preventative	254	254	0	01OCT98	30SEP99	0
D5F0299R00	Maintenance - Routine	254	254	0	01OCT98	30SEP99	0
D5F0299M00	Maintenance - Major IWCP's	254	254	0	01OCT98	30SEP99	1
D5F0200C00	Maintenance - Corrective	254	254	0	01OCT99	29SEP00	0
D5F0200P00	Maintenance - Preventative	254	254	0	01OCT99	29SEP00	0



Project Start 01OCT97
Project Finish 28SEP07
Data Date 01OCT98
Run Date 03MAY99

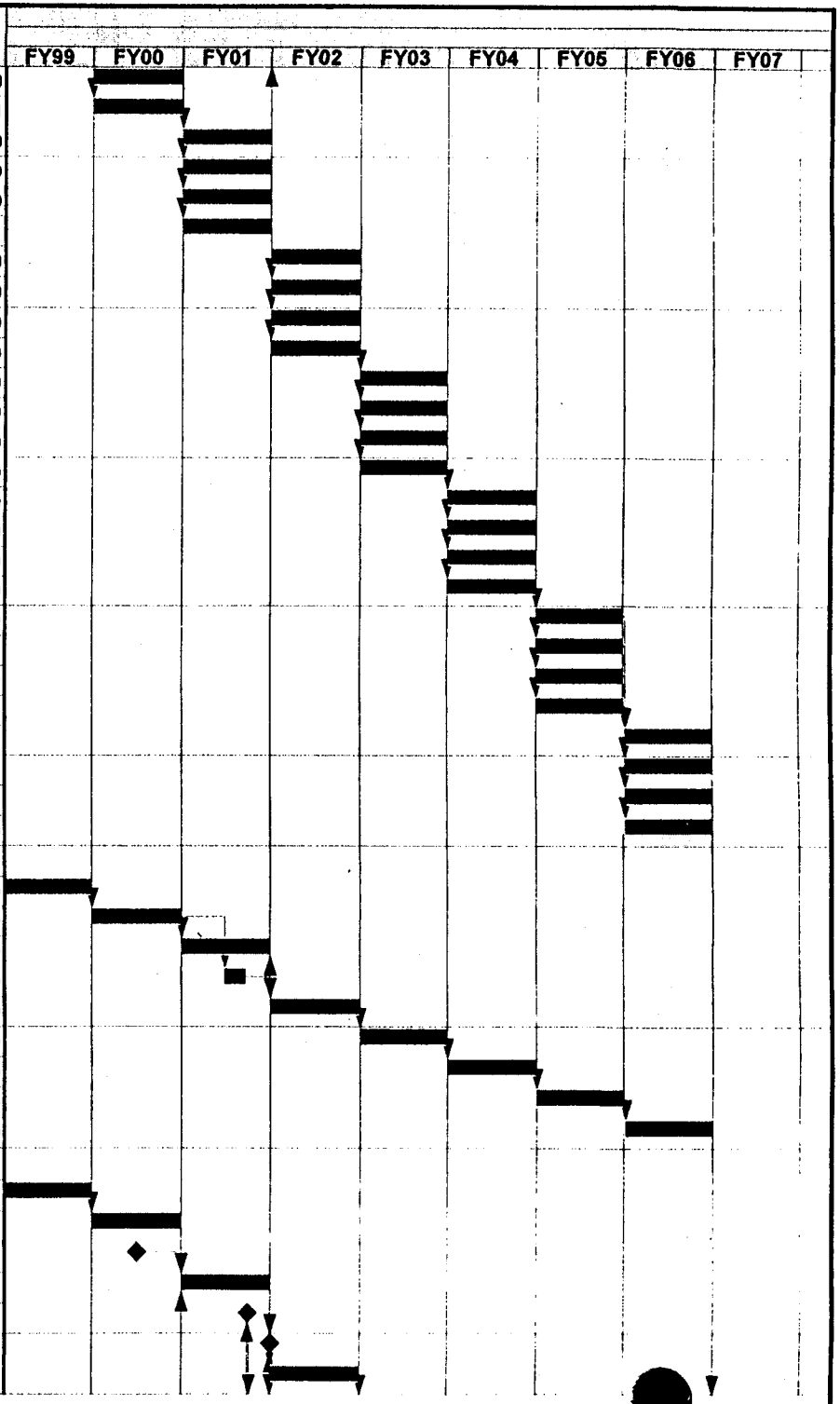
Early Bar
Progress Bar
Critical Activity

CPBT:W035

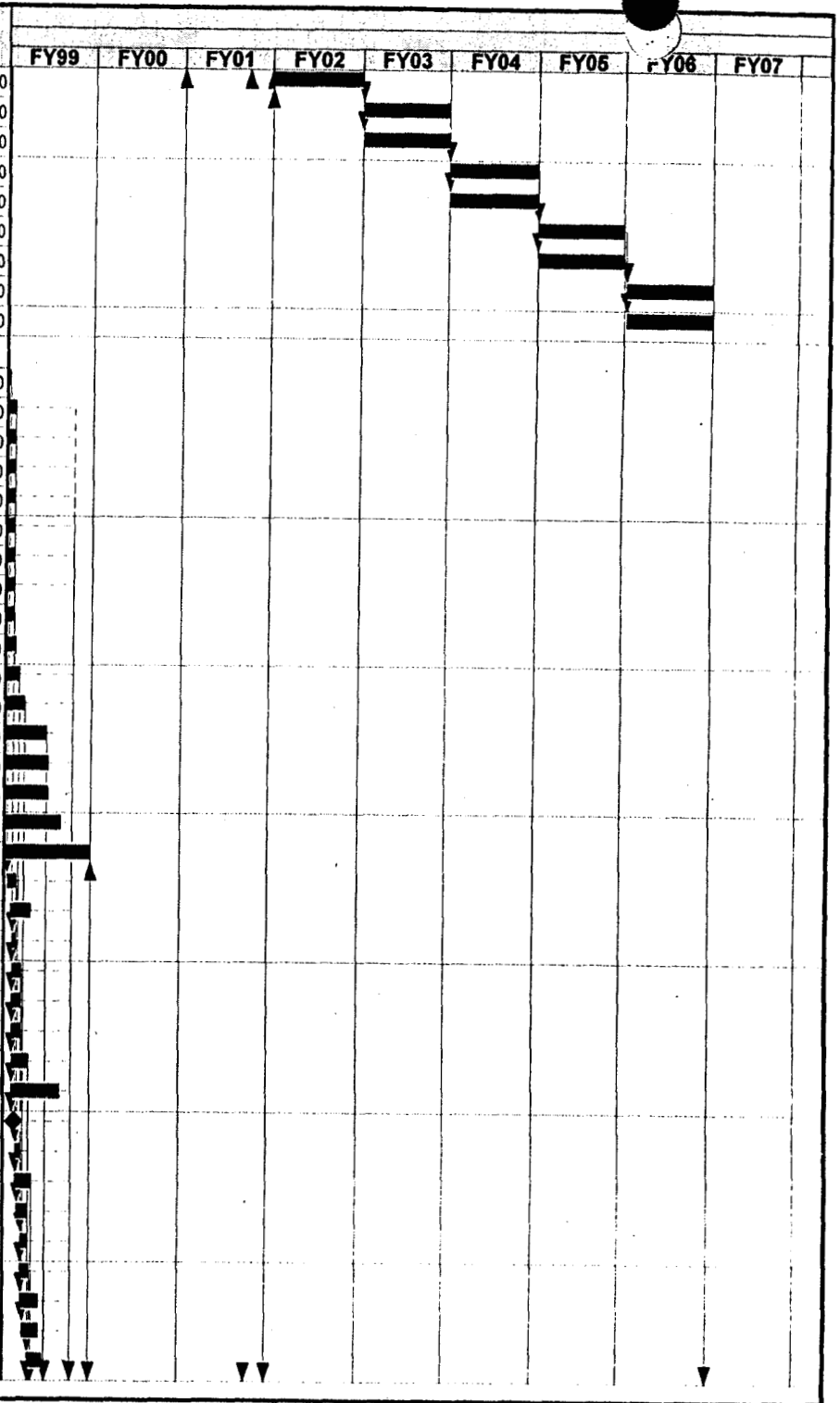
Sheet 1 of 8

KAISER-HILL COMPANY
CLOSURE PROJECT BASELINE SCHEDULE
02BILSTEIN - EMSS LIST

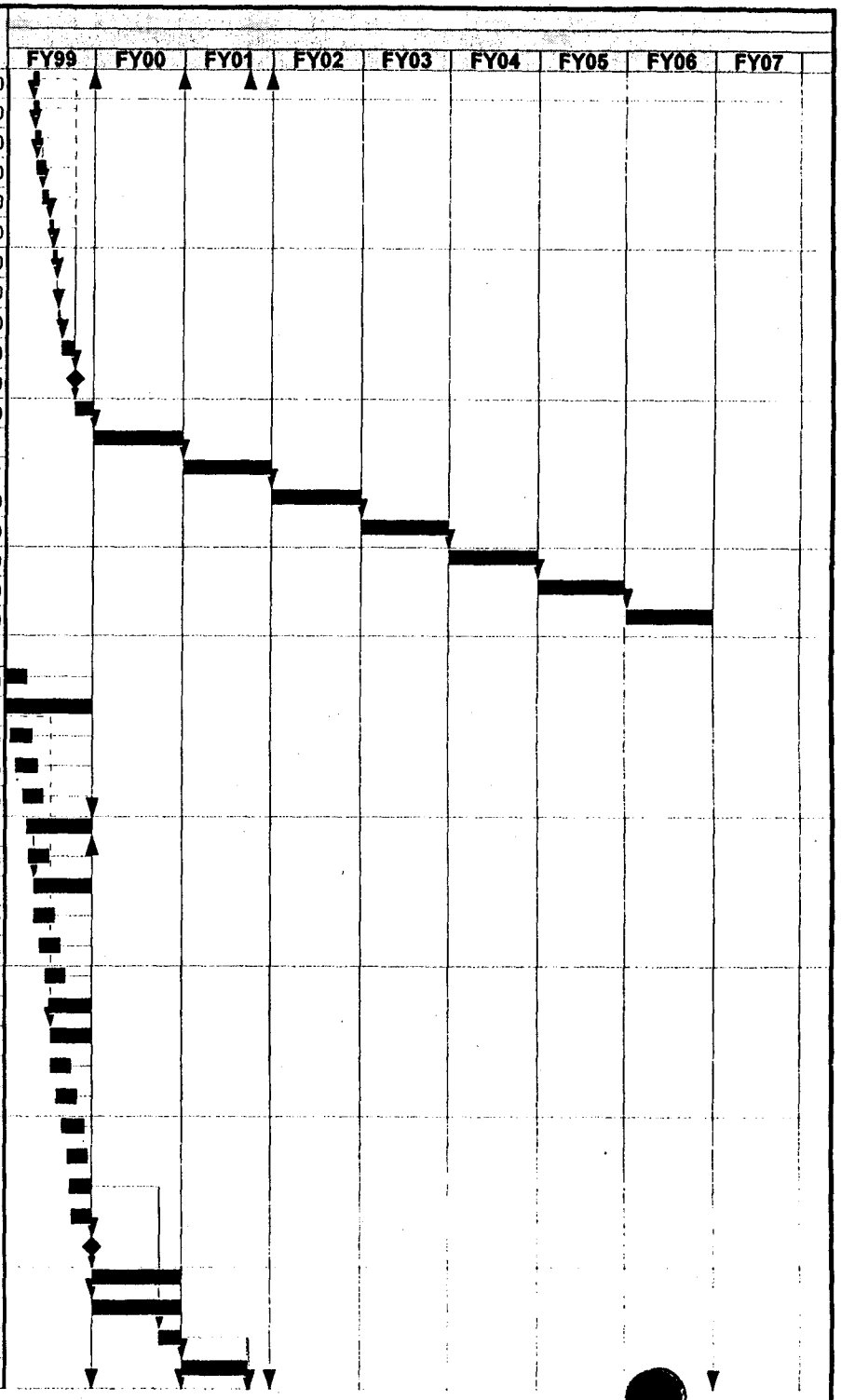
Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Early Finish	Total Float
D5F0200R00	Maintenance - Routine	254	254	0	01OCT99	29SEP00	0
D5F0200M00	Maintenance - Major IWCP's	254	254	0	01OCT99	29SEP00	1
D5F0201C00	Maintenance - Corrective	253	253	0	02OCT00	28SEP01	0
D5F0201P00	Maintenance - Preventative	253	253	0	02OCT00	28SEP01	0
D5F0201R00	Maintenance - Routine	253	253	0	02OCT00	28SEP01	0
D5F0201M00	Maintenance - Major IWCP's	253	253	0	02OCT00	28SEP01	1
D5J4802AB0	D&D Support Service - AB Maintenance	254	254	0	01OCT01	30SEP02	0
D5J4802C00	D&D Support Service - Corrective Maintenance	254	254	0	01OCT01	30SEP02	0
D5J4802P00	D&D Support Service - Preventative Maintenance	254	254	0	01OCT01	30SEP02	0
D5J4802R00	D&D Support Service - Routine Maintenance	254	254	0	01OCT01	30SEP02	0
D5J4803AB0	D&D Support Service - AB Maintenance	254	254	0	01OCT02	30SEP03	0
D5J4803C00	D&D Support Service - Corrective Maintenance	254	254	0	01OCT02	30SEP03	0
D5J4803P00	D&D Support Service - Preventative Maintenance	254	254	0	01OCT02	30SEP03	0
D5J4803R00	D&D Support Service - Routine Maintenance	254	254	0	01OCT02	30SEP03	0
D5J4804AB0	D&D Support Service - AB Maintenance	255	255	0	01OCT03	30SEP04	0
D5J4804C00	D&D Support Service - Corrective Maintenance	255	255	0	01OCT03	30SEP04	0
D5J4804P00	D&D Support Service - Preventative Maintenance	255	255	0	01OCT03	30SEP04	0
D5J4804R00	D&D Support Service - Routine Maintenance	255	255	0	01OCT03	30SEP04	0
D5J4805AB0	D&D Support Service - AB Maintenance	254	254	0	01OCT04	30SEP05	0
D5J4805C00	D&D Support Service - Corrective Maintenance	254	254	0	01OCT04	30SEP05	0
D5J4805P00	D&D Support Service - Preventative Maintenance	254	254	0	01OCT04	30SEP05	0
D5J4805R00	D&D Support Service - Routine Maintenance	254	254	0	01OCT04	30SEP05	0
D5J4806AB0	D&D Support Service - AB Maintenance	253	253	0	03OCT05	29SEP06	0
D5J4806C00	D&D Support Service - Corrective Maintenance	253	253	0	03OCT05	29SEP06	0
D5J4806P00	D&D Support Service - Preventative Maintenance	253	253	0	03OCT05	29SEP06	0
D5J4806R00	D&D Support Service - Routine Maintenance	253	253	0	03OCT05	29SEP06	0
1.1.06.12.01.03 776/777 CLUSTER OPERATIONS TECH SUPPORT							
D5F0399T00	Operations Technical Support	254	254	0	01OCT98	30SEP99	0
D5F0300T00	Operations Technical Support	254	254	0	01OCT99	29SEP00	0
D5F0301T00	Operations Technical Support	253	253	0	02OCT00	28SEP01	0
D5F0300T12	FY-99/00 Unfunded Procure Telelick System	63	63	0	23MAR01	20JUN01	0
D5J4802T00	D&D Support Service - Operations Tech Support	254	254	0	01OCT01	30SEP02	0
D5J4803T00	D&D Support Service - Operations Tech Support	254	254	0	01OCT02	30SEP03	0
D5J4804T00	D&D Support Service - Operations Tech Support	255	255	0	01OCT03	30SEP04	0
D5J4805T00	D&D Support Service - Operations Tech Support	254	254	0	01OCT04	30SEP05	0
D5J4806T00	D&D Support Service - Operations Tech Support	253	253	0	03OCT05	29SEP06	0
1.1.06.12.01.04 776/777 CLUSTER OPERATIONS MANAGEMENT							
D5F0499M00	Operations Management	254	254	0	01OCT98	30SEP99	0
D5F0400M00	Operations Management	254	254	0	01OCT99	29SEP00	0
D5FMILE283	Complete B776/777 Nuclear Operatons	0	0	0		29MAR00	129
D5F0401M00	Operations Management	253	253	0	02OCT00	28SEP01	0
D5HMILE306	FY01-T1 Holdup Removal Of Area ABV STL	0	0	0		29JUN01	1
D5JMILE172	B776/777 Start D&D	0	0	0	01OCT01		0
D5J4802F00	Support Service - Facility Infrastructure	254	254	0	01OCT01	30SEP	0



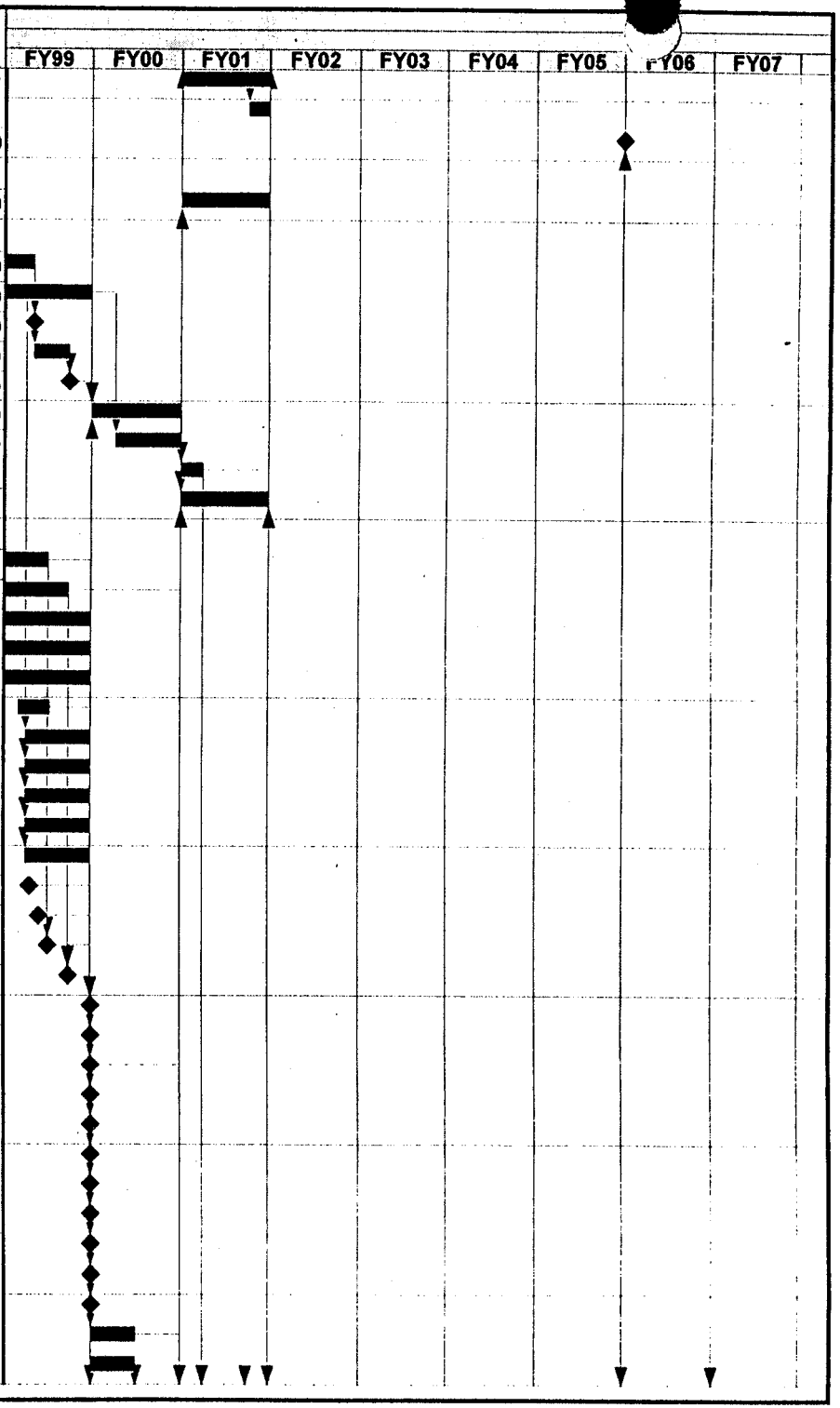
Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Finish	Total Float
D5J4802MG0	D&D Support Service - Operations Management	254	254	0	01OCT01	30SEP02	0
D5J4803F00	D&D Support Service - Facility Infrastructure	254	254	0	01OCT02	30SEP03	0
D5J4803MG0	D&D Support Service - Operations Management	254	254	0	01OCT02	30SEP03	0
D5J4804F00	D&D Support Service - Facility Infrastructure	255	255	0	01OCT03	30SEP04	0
D5J4804MG0	D&D Support Service - Operations Management	255	255	0	01OCT03	30SEP04	0
D5J4805F00	D&D Support Service - Facility Infrastructure	254	254	0	01OCT04	30SEP05	0
D5J4805MG0	D&D Support Service - Operations Management	254	254	0	01OCT04	30SEP05	0
D5J4806F00	D&D Support Service - Facility Infrastructure	253	253	0	03OCT05	29SEP06	0
D5J4806MG0	D&D Support Service - Operations Management	253	253	0	03OCT05	29SEP06	0
1.1.06.12.01.05	**AUTH BASIS DEV AND IMPL B776/777**						
D5F0599N91	A/B Imp Freeze Protection Program (DF)	10	10	0	01OCT98	15OCT98	0
D5F0599N10	A/B Imp General Applications (JS)	24	24	0	01OCT98	06NOV98	0
D5F0599N15	A/B Imp Radiation Protection Program (EB)	24	24	0	01OCT98	06NOV98	0
D5F0599N20	A/B Imp Criticality Safety Program (RS)	24	24	0	01OCT98	06NOV98	0
D5F0599N30	A/B Imp Training Program (GC)	24	24	0	01OCT98	06NOV98	0
D5F0599N35	A/B Imp - Emergency Preparedness Program (WT)	24	24	0	01OCT98	06NOV98	0
D5F0599N40	A/B Imp Organization and Management (DN)	24	24	0	01OCT98	06NOV98	0
D5F0599N80	A/B Imp BIO Maintenance (AD)	24	24	0	01OCT98	06NOV98	0
D5F0599N90	A/B Imp Hazardous Mtl Protection Program (JJW)	24	24	0	01OCT98	06NOV98	0
D5F0599N00	B776/777 BIO Approval Activities (REV 1)	28	28	0	01OCT98	12NOV98	0
D5F0599N25	A/B Imp Inventory Control Program (TT)	38	38	0	01OCT98	02DEC98	0
D5F0599N45	A/B Imp Fire Protection Program (BM)	50	50	0	01OCT98	21DEC98	0
D5F0599N92	A/B Imp Design Features (TBD1)	110	110	0	01OCT98	26MAR99	0
D5F0599NA5	A/B Imp Seal Cable Hole	113	113	0	01OCT98	31MAR99	0
D5F0599NA6	A/B Imp Fire Retardant Coating	113	113	0	01OCT98	31MAR99	0
D5F0599NA7	A/B Imp - Proof File Development and Maint (MJS)	150	150	0	01OCT98	27MAY99	0
D5F0599N05	A/B Imp - Project Management/Administrative Spt	228	228	0	01OCT98	30SEP99	0
D5F0599N94	A/B Imp Quality Assurance (DF)	24	24	0	19OCT98	23NOV98	0
D5F0599N96	A/B Imp BOA (CC)	50	50	0	02NOV98	21JAN99	0
D5F0599N60	A/B Imp Forklift Operational Controls (WT)	10	10	0	09NOV98	23NOV98	0
D5F0599N50	A/B Imp Tank Controls (JJW)	24	24	0	09NOV98	17DEC98	0
D5F0599N55	A/B Imp Compressed Gas Controls (RS)	24	24	0	09NOV98	17DEC98	0
D5F0599N65	A/B Imp - WM, EP and Transportat'n Programs (DN)	24	24	0	09NOV98	17DEC98	0
D5F0599NA1	A/B Imp - Criticality Safety System LCO/SER (JS)	40	40	0	09NOV98	14JAN99	0
D5F0599NA4	A/B Imp Training Activities (GC)	126	126	0	09NOV98	27MAY99	0
D5F0599N02	B776/777 New A/B REV 1 Submitted to RFFO	0	0	0		12NOV98	0
D5F0599NB4	A/B Imp Work Control Document SMP (DF)	15	15	0	24NOV98	18DEC98	0
D5F0599NA3	A/B Imp Compressed Air & Ntl Gas LCO/SER (WT)	40	40	0	24NOV98	29JAN99	0
D5F0599N67	A/B Imp - Conduct of Operations Program (TT)	24	24	0	03DEC98	12JAN99	0
D5F0599NB3	A/B Imp Industrial Safety SMP (RS)	15	15	0	18DEC98	13JAN99	0
D5F0599N75	A/B Imp Configuration Management Program (DN)	24	24	0	18DEC98	27JAN99	0
D5F0599N99	A/B Imp Fire Suppression System LCO/SER (JJW)	45	45	0	18DEC98	01MAR99	0
D5F0599N98	A/B Imp HVAC System Act LCO/SER (BM)	45	45	0	22DEC98	03MAR99	0
D5F0599NA2	A/B Imp Electrical Power System LCO/SER (TT)	40	40	0	13JAN99	15MAR99	0



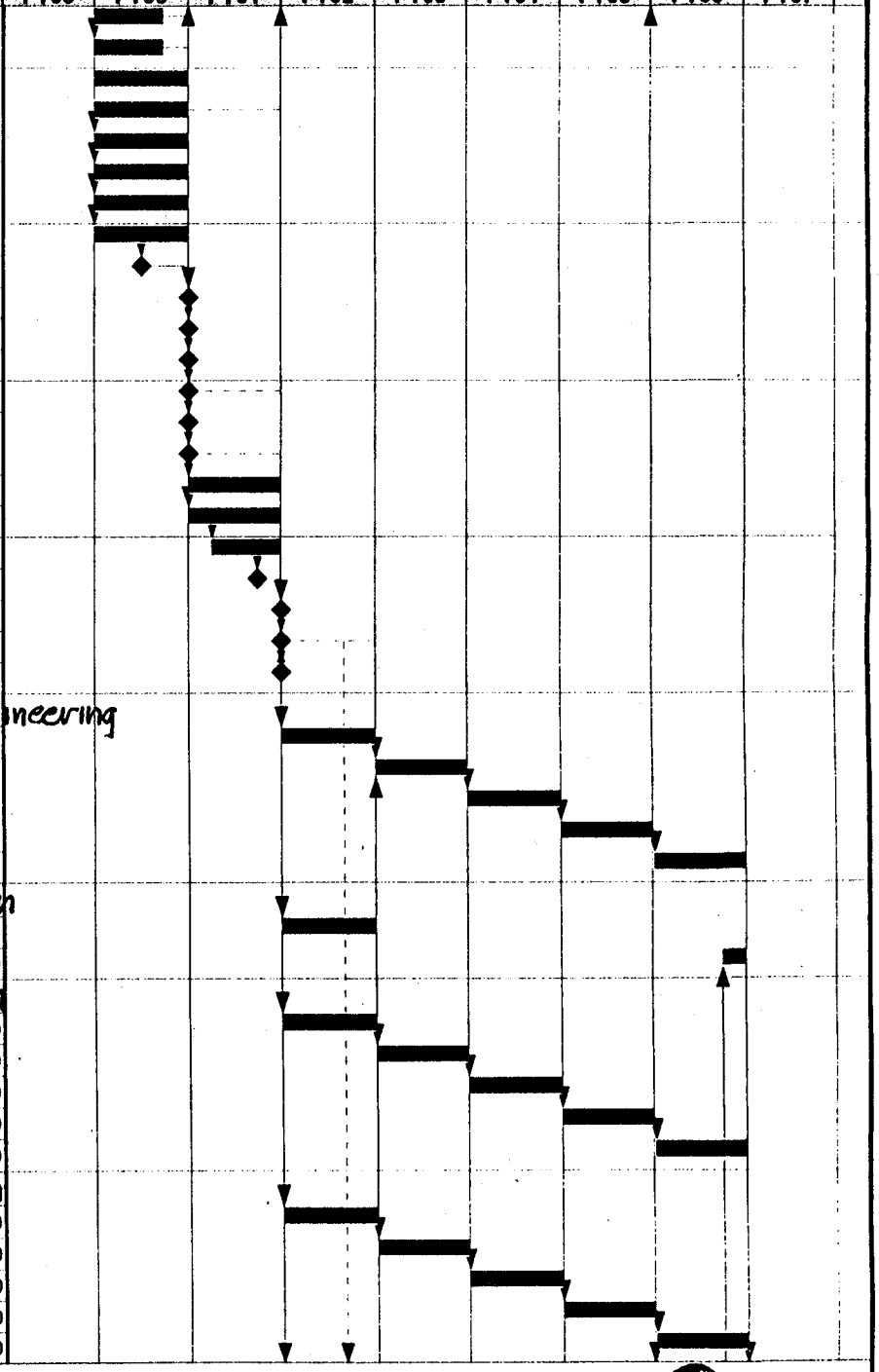
Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Early Finish	Total Float
D5F0599NB5	A/B Imp Integrated Safety Management SMP (RS)	15	15	0	14JAN99	04FEB99	0
D5F0599NB2	A/B Imp Nuclear Safety SMP (JS)	15	15	0	15JAN99	08FEB99	0
D5F0599NB1	A/B Imp Occurrence Reporting SMP (DN)	15	15	0	28JAN99	18FEB99	0
D5F0599N85	A/B Imp Maintenance Program (WT)	24	24	0	01FEB99	09MAR99	0
D5F0599N70	A/B Imp Work Control Program (DN)	15	15	0	22FEB99	15MAR99	0
D5F0599NA8	A/B Imp Final Corrective Actions	9	9	0	29MAR99	09APR99	0
D5F0599NA9	A/B Imp Management Assessment	9	9	0	12APR99	23APR99	0
D5F0599NC1	A/B Imp Management Assessment Corrective Actions	4	4	0	26APR99	29APR99	0
D5F0599NC2	A/B Imp Independent Validation Review	9	9	0	03MAY99	13MAY99	0
D5F0599NC3	A/B Imp IVR Corrective Actions	34	34	0	17MAY99	08JUL99	0
D5FCPM1901	B776/777 A/B Implementation Complete	0	0	0		09JUL99*	0
D5F0599NC4	A/B Imp Revise BIO to Include D&D, Submit to DOE	53	53	0	12JUL99	30SEP99	0
D5F0500AB0	FY-00 Authorization Basis - Maintenance	254	254	0	01OCT99	29SEP00	1
D5F0501A00	FY-01 Authorization Basis - Maintenance	253	253	0	02OCT00	28SEP01	1
D5F0502RM0	B776/777 Landlord AB Maintenance FY-02	228	228	0	01OCT01	30SEP02	0
D5F0503RM0	B776/777 Landlord - AB Maintenance FY-03	228	228	0	01OCT02	30SEP03	0
D5F0504RM0	B776/777 Landlord - AB Maintenance FY-04	229	229	0	01OCT03	30SEP04	0
D5F0505RM0	B776/777 Landlord - AB Maintenance FY-05	228	228	0	01OCT04	30SEP05	0
D5F0506RM0	B776/777 Landlord - AB Maintenance FY-06	227	227	0	03OCT05	29SEP06	0
1.1.06.12.02	**776/777 CLUSTER SNM REMOVAL OPERATIONS**						
D5P9902020	FY-99 B776/777 Remove Holdup Area 1	62	62	0	01OCT98	30DEC98	0
D5P9902005	FY-99 B776/777 SNM Holdup Removal Project Mgmt	254	254	0	01OCT98	30SEP99	1
D5P9902030	FY-99 B776/777 Remove Holdup Area 2	60	60	0	26OCT98*	21JAN99	0
D5P9902040	FY-99 B776/777 Remove Holdup Area 3	60	60	0	18NOV98*	15FEB99	0
D5P9902050	FY-99 B776/777 Remove Holdup Area 4	60	60	0	15DEC98*	10MAR99	0
D5P9902150	FY-99 B776/777 Holdup Mtl Xfer to B707	191	191	0	04JAN99*	30SEP99	1
D5P9902060	FY-99 B776/777 Remove Holdup Area 5	59	59	0	11JAN99*	01APR99	0
D5P9902160	FY-99 B707 Thermal Stabilization of B776 Holdup	171	171	0	01FEB99	30SEP99	1
D5P9902070	FY-99 B776/777 Remove Holdup Area 6	60	60	0	02FEB99*	26APR99	0
D5P9902080	FY-99 B776/777 Remove Holdup Area 7	60	60	0	25FEB99*	19MAY99	0
D5P9902090	FY-99 B776/777 Remove Holdup Area 8	60	60	0	22MAR99*	14JUN99	0
D5P9902190	FY-99 Holdup Removal Planning for FY-00 5 Areas	129	129	0	31MAR99*	30SEP99	1
D5P99SCAN0	B776/777 SNM Holdup Scans/Drum Movements	110	110	0	09APR99*	30SEP99	57
D5P9902100	FY-99 B776/777 Remove Holdup Area 9	60	60	0	13APR99*	07JUL99	0
D5P9902110	FY-99 B776/777 Remove Holdup Area 10	60	60	0	06MAY99*	30JUL99	0
D5P9902120	FY-99 B776/777 Remove Holdup Area 11	61	61	0	27MAY99*	23AUG99	0
D5P9902130	FY-99 B776/777 Remove Holdup Area 12	60	60	0	21JUN99*	14SEP99	0
D5P9902010	FY-99 B776/777 SNM Verification Walkdowns	64	64	0	01JUL99*	30SEP99	0
D5P9902140	FY-99 B776/777 Remove Holdup Area 13	60	60	0	07JUL99*	29SEP99	0
D5P9902M02	Complete Removal of Holdup from 13 Areas	0	0	0		30SEP99	0
D5P0002005	FY-00 B776/777 SNM Holdup Removal Project Mgmt	254	254	0	01OCT99	29SEP00	1
D5P0002020	FY-00 Remove Holdup Areas Identified in FY-99	254	254	0	01OCT99	29SEP00	64
D5P0002010	FY-00 B776/777 SNM Verification Walkdowns	63	63	0	03JUL00	29SEP00	0
D5P0102020	[illegible]01 Remove Holdup Areas Identified in FY-00	190	190	0	02OCT00	29JUN[illegible]	64



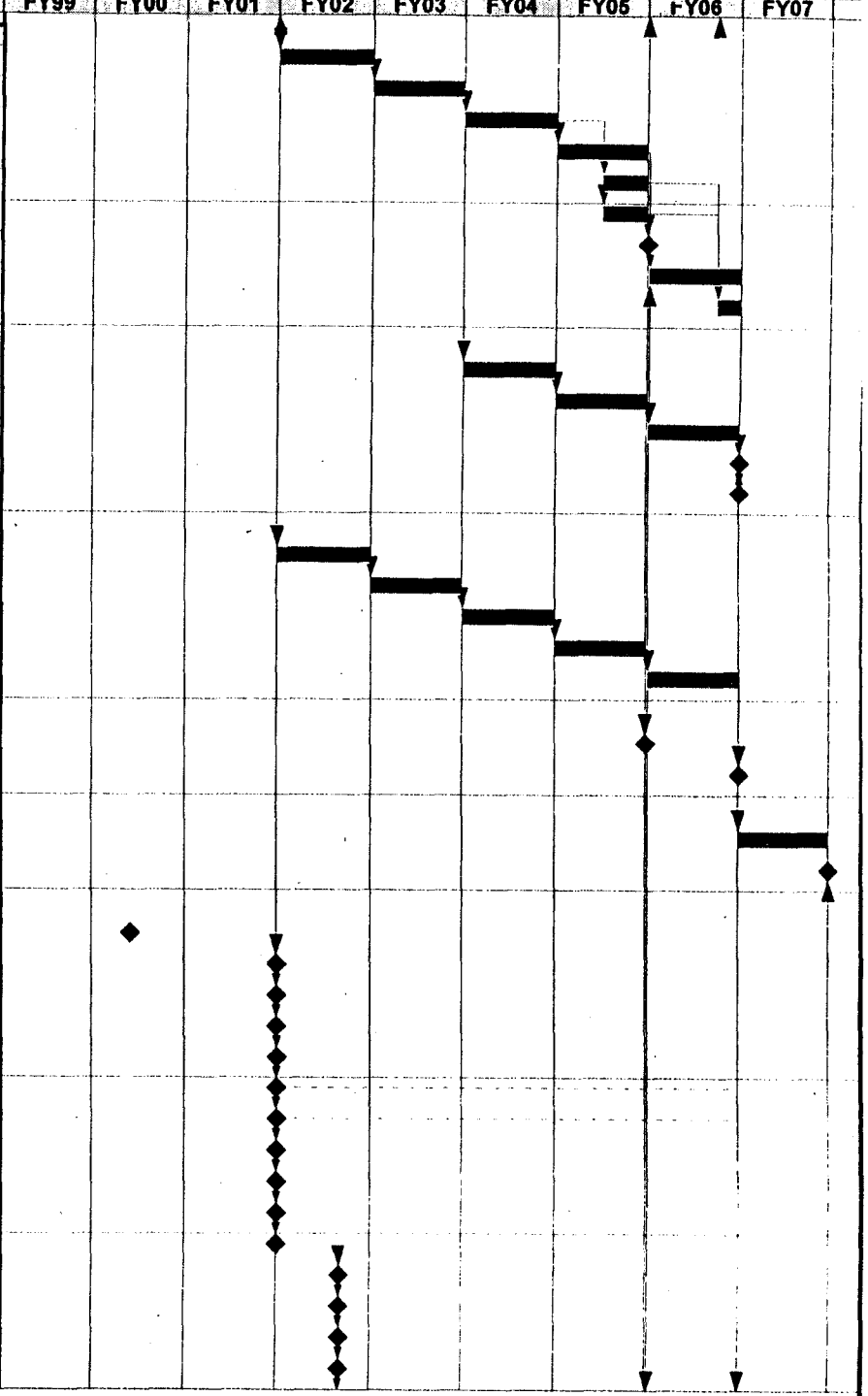
Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Finish	Total Float
D5P0102005	FY-01 B776/777 SNM Holdup Removal Project Mgmt	253	253	0	02OCT00	28SEP01	1
D5P0102010	B776/777 Final Verif Walkdowns/MAA Closure Activ	63	63	0	02JUL01	28SEP01	1
D5PMILE323	Cmpl B776/7 Remove All Rem'g Holdup Req'g Stab	0	0	0		30SEP05	0
1.1.06.12.03.01 776/777 CLUSTER DEACT CHARACTERIZATION							
D5HD101C00	FY01 B776 Building Characterization	253	253	0	02OCT00	28SEP01	0
1.1.06.12.03.02 776/777 CLUSTER DEACT PLAN AND PROJ MGMT							
D5HD299MD1	Review and Incorp RFFO Comments on DOP	83	83	0	01OCT98	29JAN99	0
D5HD299P00	FY99 B776 Deact Planning/ Project Mgmt	254	254	0	01OCT98	30SEP99	0
D5HD299MD2	Submit DOP for Public Review and Comment	0	0	0	01FEB99		0
D5HD299MD3	Public Review Period and Inc Comments on DOP	107	107	0	01FEB99	30JUN99	0
D5HMILE175	B776/777 DOP CDPHE Approved	0	0	0		30JUN99	0
D5HD200P00	FY00 B776 Deact Planning and Project Management	254	254	0	01OCT99	29SEP00	0
D5HD299P10	FY-00 Pre-Readiness Review Preparation	191	191	0	04JAN00	29SEP00	0
D5HD201P20	Perform D&D Readiness Demonstration (Set 17)	63	63	0	02OCT00	02JAN01	0
D5HD201P00	FY01 B776 Deact Planning and Project Management	253	253	0	02OCT00	28SEP01	0
1.1.06.12.03.05 776/777 CLUSTER DEACT INITIAL PHY DEACT							
D5HD599G05	FY-99 Remove Oils/Solutions from GBs	126	126	0	01OCT98	31MAR99	0
D5HD599R30	Remove Used Oils	190	190	0	01OCT98	30JUN99	0
D5HD599G01	Remove Classified from Gloveboxes	254	254	0	01OCT98	30SEP99	0
D5HD599G15	Remove Misc Items from Gloveboxes	254	254	0	01OCT98	30SEP99	0
D5HD599R35	FY-99 Rem 90% of Legacy Waste Drums	254	254	0	01OCT98	30SEP99	0
D5HD599A01	Disposition B776/777 Actuators	82	82	0	03DEC98	12APR99	108
D5HD599R10	Remove Classified from Rooms	191	191	0	04JAN99	30SEP99	0
D5HD599R15	FY-99 Rem Microwave Samples from B701	191	191	0	04JAN99	30SEP99	0
D5HD599T05	FY-99 Drain Tks T1&T2 Rem Raschig Rings	191	191	0	04JAN99	30SEP99	0
D5HD599T15	FY-99 Drain Vacuum Accumulators	191	191	0	04JAN99	30SEP99	0
D5HD599T20	FY-99 Drain Low Level Oils Tks B776/777	191	191	0	04JAN99	30SEP99	0
D5HD599RM1	Comp Rem'l of Combust liquid-bearing drums Rm134	0	0	0		15JAN99	0
D5HD599GM1	Remove bulk oils from 7 gloveboxes Rms 131&134E	0	0	0		26FEB99	2
D5HD599GM2	Comp Deactivation of 7 gloveboxes Rms 131 & 134E	0	0	0		31MAR99	0
D5HD5992B1	Comp Rem Used Oils Cont'rs from Rm131 & Rm477	0	0	0		30JUN99	64
D5HCPM1902	Disposition of Actuators in B777	0	0	0		30SEP99*	0
D5HD5991C3	FY-99 Comp Rem Misc Items from 8 GB Sets	0	0	0		30SEP99	0
D5HD599M22	B776/7 Cmpl Removal 90% Backlog Legacy Waste	0	0	0		30SEP99	0
D5HD599MS1	FY99 Comp Draining LL Oil Tanks B776/7	0	0	0		30SEP99	0
D5HD599MS4	FY99 Comp Rem B701 MicroTreatm't Sples	0	0	0		30SEP99	0
D5HD599MS7	FY99 Comp Rem of oils/solutions 6 GBs	0	0	0		30SEP99	0
D5HD599MS9	FY99 Comp Draing/Raschig Rem Tks T1,T2	0	0	0		30SEP99	0
D5HD599MSA	FY99 Comp Vac'm Accumul drain to RCRA Sta	0	0	0		30SEP99	0
D5HD599MSB	FY99 Comp Rem/Disp'n Classif'd Items	0	0	0		30SEP99	0
D5HD599PM1	FY-99 Comp Metric 1 PM 99/00-7.5R B776/7	0	0	0		30SEP99	0
D5HD599PM2	FY-99 Comp Metric 2 PM 99/00-7.5R B776/7	0	0	0		30SEP99	0
D5HD599T25	FY-99 Drain/Remove Trichlorethane Line	126	126	0	01OCT99	30MAR00	0
D5HD500T05	Drain SRV Tanks (SR3, 4 & 5)	127	127	0	01OCT99	31MAR00	0



Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Early Finish	Total Float
D5HD500T10	Drain Tanks T360,T370,T344 & T345 to RCRA Stable	182	182	0	01OCT99	19JUN00	0
D5HD500T15	Drain FBI Pilot Tanks to RCRA Stable	182	182	0	01OCT99	19JUN00	0
D5HD500G00	FY-00 B776/777 Glovebox Deactivation	254	254	0	01OCT99	29SEP00	0
D5HD500R10	FY-00 B776/777 Room Deact and Equipment Removal	254	254	0	01OCT99	29SEP00	0
D5HD500R15	Remove Classified Telecom Sys/Docs from Rooms	254	254	0	01OCT99	29SEP00	0
D5HD599G16	Remove Sources from Gloveboxes	254	254	0	01OCT99	29SEP00	0
D5HD599R20	Remove Sources from Rooms	254	254	0	01OCT99	29SEP00	0
D5HD599R25	Remove Loose Hazardous Materials from Rooms	254	254	0	01OCT99	29SEP00	0
D5HD500M01	Complete SR3,4&5 Tank Draining	0	0	0		31MAR00	0
D5HMILE320	FY00-T5 Drain Mixed Residue Tanks Complete	0	0	0		28SEP00	0
D5HD500MS1	Comp Draining of Rem Tanks/Ancillary Eq to RCRA	0	0	0		29SEP00	0
D5HD500MS2	Clean out GBs in Sets 1,14,20,29,41 and 69	0	0	0		29SEP00	0
D5HD500MS8	FY99 Comp Rem Radioact Sources from GB&Rms	0	0	0		29SEP00	0
D5HD599MS5	FY-00 Comp Rem of Loose Haz Mtls	0	0	0		29SEP00	0
D5HMILE499	B776/777 Complete Legacy Waste Removal	0	0	0		29SEP00	253
D5HD501R05	FY-01 B776/777 Room Deact and Equipment Removal	253	253	0	02OCT00	28SEP01	0
D5HD501R10	Advanced Size Reduction Facility	253	253	0	02OCT00	28SEP01	0
D5HD501G22	FY-01 D&D/Remove Set 17	190	190	0	03JAN01	28SEP01	0
D5HMILE311	FY01-T2 Close MAA In B776 / 777	0	0	0		29JUN01	0
D5HMILE465	B776/777 Complete Excess Property Removal	0	0	0		27SEP01	0
D5FMILE392	B776/777 Deactivation Complete	0	0	0		28SEP01	0
D5HD500MS3	FY99 Comp Rem of Loose Haz Mtls, Rms	0	0	0		28SEP01	0
1.1.06.12.04.01	**B776/777 ~~DECOM-RM 126 DIMENSIONAL MET GB~~ D&D Planning & Engineering**						
D5J4102PE0	D&D Planning & Engineering	254	254	0	01OCT01	30SEP02	0
D5J4103PE0	D&D Planning & Engineering	254	254	0	01OCT02	30SEP03	0
D5J4104PE0	D&D Planning & Engineering	255	255	0	01OCT03	30SEP04	0
D5J4105PE0	D&D Planning & Engineering	254	254	0	01OCT04	30SEP05	0
D5J4106PE0	D&D Planning & Engineering	253	253	0	03OCT05	29SEP06	0
1.1.06.12.04.02	**B776/7 ~~DECOM SET 2-ROOM 126,132,133,137B~~ D&D Characterization**						
D5J4202CH0	D&D Characterization	254	254	0	01OCT01	30SEP02	0
D5J4206CH0	Pre-Remediation Characterization	63	63	0	03JUL06	29SEP06	0
1.1.06.12.04.03	**B776/7 ~~DECOM SET 3 HYDRAULIC OIL SYS,2ND~~ D&D Site Preparation**						
D5J4302SP0	D&D Site Preparation	254	254	0	01OCT01	30SEP02	0
D5J4303SP0	D&D Site Preparation	254	254	0	01OCT02	30SEP03	0
D5J4304SP0	D&D Site Preparation	255	255	0	01OCT03	30SEP04	0
D5J4305SP0	D&D Site Preparation	254	254	0	01OCT04	30SEP05	0
D5J4306SP0	D&D Site Prep (Out Bldgs and Closeout Doc)	253	253	0	03OCT05	29SEP06	0
1.1.06.12.04.04	**B776/7 ~~DECOM SET 4-PART R131 DLINE & GBX~~ D&D Decontamination**						
D5J4402DC0	D&D Decontamination	254	254	0	01OCT01	30SEP02	0
D5J4403DC0	D&D Decontamination	254	254	0	01OCT02	30SEP03	0
D5J4404DC0	D&D Decontamination	255	255	0	01OCT03	30SEP04	0
D5J4405DC0	D&D Decontamination	254	254	0	01OCT04	30SEP05	0
D5J4406DC0	D&D Decontamination (Out Bldgs and Closeout Doc)	253	253	0	03OCT05	29SEP06	0



Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Finish	Total Float
1.1.06.12.04.05 B776/7 ~~DECOM SET 6 PART R131 DLINE & GBX~~ D&D Dismantlement							
D5J4502DM0	D&D Dismantlement	254	254	0	01OCT01	30SEP02	0
D5J4503DM0	D&D Dismantlement	254	254	0	01OCT02	30SEP03	0
D5J4504DM0	D&D Dismantlement	255	255	0	01OCT03	30SEP04	0
D5J4505DM0	D&D Dismantlement	254	254	0	01OCT04	30SEP05	0
D5J4506DD0	Prep and Issue RFP & Award Demolition Contract	128	128	0	01APR05	30SEP05	0
D5J4506DD1	Prep/Rev/App Demo Survey Rpt	128	128	0	01APR05	30SEP05	0
D5JMILE405	B776/777 Cmpl Zone 1 Stripout & Decon & Term Sys	0	0	0		30SEP05	0
D5J4506DM0	D&D Dismantlement (Spt Facilities/Closeout)	253	253	0	03OCT05	29SEP06	0
D5J4506DD3	Prep/Rev/Issue Final Completion Report	63	63	0	03JUL06	29SEP06	0
1.1.06.12.04.06 B776/7 ~~DECOM SET 6 PART R131 DLINE & GBX~~ D&D Demolition							
D5J4604DE0	D&D Demolition (Internal)	255	255	0	01OCT03	30SEP04	0
D5J4605DE0	D&D Demolition (Internal)	254	254	0	01OCT04	30SEP05	0
D5J4606DE0	D&D Demolition/Waste Removal and Demobilize	253	253	0	03OCT05	29SEP06	0
D5J4006000	WAD 35 B776/777 - Finish Decommissioning (MR8)	0	0	0		29SEP06	0
D5J4006M50	D&D Complete B776/7 (MCP-5)	0	0	0		29SEP06	0
1.1.06.12.04.07 B776/7 ~~DECOM SET 7 TANKS 1103,1104,1106~~. D&D Proj & Ops Mgmt							
D5J4702OP0	D&D Project & Operations Management	254	254	0	01OCT01	30SEP02	0
D5J4703OP0	D&D Project & Operations Management	254	254	0	01OCT02	30SEP03	0
D5J4704OP0	D&D Project & Operations Management	255	255	0	01OCT03	30SEP04	0
D5J4705OP0	D&D Project & Operations Management	254	254	0	01OCT04	30SEP05	0
D5J4706OP0	D&D Project & Operations Management	253	253	0	03OCT05	29SEP06	0
1.1.06.12.04.82 B776/7-BUILDING SHELL							
D5JMILE357	Complete 776/7 PWTSN Flow/Tmasfer Utility Water	0	0	0		30SEP05	0
D5JMILE414	Complete B776/777 Demolition	0	0	0		29SEP06	0
1.1.06.12.05 776/777 CLUSTER CLOSURE							
D5K5007CC0	WAD 35 B776/777 - Cluster Closure	253	253	0	02OCT06	28SEP07	0
D5FMILE560	Complete B776/777 Closure	0	0	0		28SEP07	0
1.1.06.12.06 REMEDIATE/CONTAIN 776/777 CLUSTER HIGH R							
D5RFS04776	VUL RFSW77604 Fire protection program weakness	0	0	0		28FEB00*	152
D5RFP77603	VUL RFP776/77703 Storage Pu solution in plastic	0	0	0		28SEP01	0
D5RFS07776	VUL RFSW77607 Crit safe controls for mtrl	0	0	0		28SEP01	764
D5RFS08776	VUL RFSW77608 Emp aware fissle mtrl presence	0	0	0		28SEP01	764
D5RFS02776	VUL RFSW77602 Crit safety inst weakness/vul	0	0	0		28SEP01	1,018
D5RFP77613	VUL RFPSW776SI3 Inventory delta due to holdup	0	0	0		28SEP01	1,270
D5RFS03776	VUL RFSW77603 Layoffs/loss of exp personnel	0	0	0		28SEP01	1,270
D5F2042801	VUL RFP776A BREACHED PITS IN VAULT	0	0	0		28SEP01	1,523
D5RF776001	VUL RF776/77701 plastic contact w/ Pu cont HEU M	0	0	0		28SEP01	1,523
D5RF776002	VUL RF776/77702 AB Doc not include 776 Hazard/Op	0	0	0		28SEP01	1,523
D5RFS05776	VUL RFSW77605 Lack cont fire water runoff cont	0	0	0		28SEP01	1,523
D5MFP0776H	VUL RFPSW776H RES WASTE DRUMS BLOCKING	0	0	0		31MAY02	594
D5MFP0776I	VUL RFPSW776I RES DRUMS INCR FIRES/EXPLOSION	0	0	0		31MAY02	594
D5MFP0776N	VUL RFPSW776N RES WASTE DRUMS IN HALL/WORK A	0	0	0		31MAY02	594
D5MFP77606	VUL RFP776/77706 BREACH OF MATL STORAGE	0	0	0		31MAY02	1,353



Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Early Finish	Total Float
D5MFP77607	VUL RFP776/77707 MATL FIRE IN RES STOR	0	0	0		31MAY02	1,353
D5F6006HR0	WAD 35 B776/777 - High Risk IHSS Planning	190	190	0	03OCT05	30JUN06	0
D5RFP77601	VUL RFP776/77701 Facility fire not breach Bldg	0	0	0		29SEP06	0
D5RFP77602	VUL RFP776/77702 Int explosion n-breach Facl Rad	0	0	0		29SEP06	0
D5RFP77604	VUL RFP776/77704 Loss confinment frm equip/Emp e	0	0	0		29SEP06	0
D5RFP77605	VUL RFP776/77705 Crit w/o Bldg structural failur	0	0	0		29SEP06	0
D5RFP77608	VUL RFP776/77708 Emp exposure fire/explode/seism	0	0	0		29SEP06	0
D5RFP77609	VUL RFP776/77709 Rad release at seismic event	0	0	0		29SEP06	0
D5RFP77610	VUL RFP776/77710 Aircraft crash offsite release	0	0	0		29SEP06	0
D5RFP77614	VUL RFPSW776SI4 Multiple coincident events	0	0	0		29SEP06	0
D5RFPS776A	VUL RFPSW776A Emp exposure alarm sys/high noise	0	0	0		29SEP06	0
D5RFPS776D	VUL RFPSW776D Rubber Gloves/plastic bags on GBs	0	0	0		29SEP06	0
D5RFPS776E	VUL RFPSW776E Contamination from out use equip	0	0	0		29SEP06	0
D5RFPS776F	VUL RFPSW776F Age/limited MC&A counting equip	0	0	0		29SEP06	0
D5RFPS776G	VUL RFPSW776G Potential leak rad mtrl via HEPA	0	0	0		29SEP06	0
D5RFPS776K	VUL RFPSW776K Lack maint/equip ugrade ncr expose	0	0	0		29SEP06	0
D5RFPS776O	VUL RFPSW776O Fire protection vent spray on HEPA	0	0	0		29SEP06	0
D5RFPS776P	VUL RFPSW776P Exhaust fan damper failure	0	0	0		29SEP06	0
D5RFPS776Q	VUL RFPSW776Q Emp exposure due Crit/un-ID source	0	0	0		29SEP06	0
D5L6007HR0	WAD 35 B776/777 - High Risk IHSS Remediation	190	190	0	02OCT06	29JUN07	0
D5LMILE435	Complete B776/777 IHSS / UBC Remediation	0	0	0		28JUN07	0
D5L6007HR1	Prepare and Submit Final Report B776/7 (I12)	63	63	0	02JUL07	28SEP07	0